Machine Tool Blue Book

NOVEMBER, 1936

THIRTY-FIRST YEAR

RECISIO

HARDINGE Ball Bearing Bench Lathe Unit



1º Collet Capacity-9º Swing-Four Smaller Sizes.

Ask For Bulletin BB

ARDINGE BROTHERS, INC., - ELMIRA, N. Y.

CHICAGO - NEW YORK - DETROIT
Sales Representatives in All Principal Cities

PUBLISHED AT 508 So. DEARBORN ST. CHICAGO



If you want one saw that will do "everything" you want a MARVEL No. 8 metal-cutting Band Saw that will cut 1/4" rods or 18"x18" billets, that cuts perpendicularly or at 450 right or left, that can be fed by hand or with power feed—and does all things well.

Accurate, fast, straight cutting and above all universal, the MARVEL No. 8 is usually the busiest machine tool on the floor, whether it's in the tool room, stock room, millwright department, forge or die shop.

Each user has his special uses; all agree it is exactly suited to their work.





ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"
341 N. Francisco Ave., CHICAGO. U. S. A.

9mbrove Performance

LS 17H

LOOK AT THE CHIPS!

WELDON CUP-POINT

mills are stronger—
eject chips better—
out-perform any
dinary style end-

May we prove it in your shop?

OL CO.

321 FRANKFORT AVE. CLEVELAND, O.

Pioneers in Fast Spiral Double end End Mills Rivett

DRAW-IN COLLETS AND CHUCKS



SPRING TEMPERED

Scientifically heat treated to a true spring temper, "RIVETT MARK" collets resist wear and hold their spring longer than collets of any other make. Carried in stock for all standard lathes and milling machines. Write for Bulletin 100-B.

ORDER FROM STOCK

CHICAGO

R. E. Ellis Engineering Co., 621 W. Washington Blvd., DETROIT

Chas. A. Streling Co. 149 E. Larned St.

RIVETT LATHE & GRINDER INC.

BRIGHTON, BOSTON, MASS.

4

Machine Tool Blue Book

Selected Circulation 22,500 Monthly

NOVEMBER, 1936

THIRTY-FIRST YEAR

A More Competitive Market

The Index of Machine Tool Orders had a pre-election drop in September to 118.5.

This means that each manufacturer must increase his sales efforts to hold his own in a more competitive market.

As we all know, advertising is an important factor in selling. But the selection of the right medium is also vital.

The "Blue Book" has been producing some wonderful results—proof upon request. Yet a page in this publication costs less than a half page in any other monthly in its field. A double page spread, even in two colors, costs less than one page in the others.

For advertising purposes the "Blue Book" is a "natural", properly conceived to give the best results at lowest cost.

Rates and further data upon application.

Published By

Hitchcock Publishing Co. 508 S. Dearborn St., Chicago, Ill.

Consult the Classified Finding Index for your requirements



COLLET AND FEED



Ask for this bulletin No. 36 if you have LATHES and MILLERS

HARDINGE COLLETS FOR: American, Ames, Bove & Emmes, Carroll & Jamieson, Chard, Cincinnati, Cisco, Dalton, Flather, Greaves-Klusman, Hamilton, Hendey, LeBlond, Monarch, Porter Cable, Pratt & Whitney, Rahn Larmon, Reed-Prentice, Rivett, Rockford, Sebastian, Seneca, Sidney, South Bend, Springfield, Stark, Sundstrand and our own Hardinge Cataract Lathes.

HARDINGE COLLETS FOR: Ames, Becker, Burke, Pratt & Whitney, Reed-Prentice, Rockford, Stark, Sundstrand, Van Norman and our own Hardinge Cataract Millers.

Bulletin No. 36 gives complete information; dimensions of standard collets: lists attractive prices; makes ordering easy. Gives location of collet stocks in six important centers in the United States.

-SPECIFY HARDINGE COLLETS-

HARGINGE BROTHERS, Inc. ELMIRA, N. Y.

FINGER SECTION





Ask for this catalog No. 34A if you have AUTOMATIC and HAND SCREW MACHINES

MORRISON COLLETS, FEED FINGERS, MASTER COLLETS, MASTER FEED FINGERS AND PADS FOR: Brown & Sharpe, Cleveland, Cone, Gridley, National Acme, New Britain, Davenport, etc., Automatics.

MORRISON COLLETS FOR: Bardons & Oliver, Cincinnati, Foster, Garvin, Pratt & Whitney, Warner & Swasey, etc., Hand Screw Machines.

Catalog No. 34A gives complete ordering information and lists attractive prices. Illustrates and describes Style "B" Morrison Master Feed Fingers and Pads which eliminate scoring of stock.

-STANDARD SIZES FROM STOCK-

MORRISON MACHINE PRODUCTS, Inc., ELMIRA, N. Y.



For roughing and finishing cuts, either right or left hand

The R & L Turning Tool will make quick work of roughing either one or two diameters, used as a balanced turning tool. No special tool bits are required.

Entire tool is made of heat treated alloy steel in three standard sizes or built to order according to your specifications.

This Tool will reduce costs

R AND L TOOLS

Turning Tool



Can be changed from right to left hand in ten seconds' time

Save on your Tools. The R and L Turning Tool will do the work of several of your other tools, singly or in combination.

Tantalum Carbide burnishers will not scratch or mar the surface of the work. No rollers to wear or get out of alignment.

Write today for your booklet

Nicetown, Philadelphia, Pa.



These three burs are typical examples of special shapes developed to do particular jobs in the aircrast industry.

JURS.

We have a large and diversified line of standard burs carried in stock for quick delivery. Often your problem can be solved with one of these. If not we can develop special burs for your job. The three shown opposite are examples of such special cases. Meanwhile send for a copy of our catalog showing over 300 standard burs. It is free to any interested executive.

YOU



This bur is for breaking the sharp corners of threads on chuck jaws.

name the problem!

S there in your product a difficult place to reach in finishing? Try burs Executives often fail to realize the many jobs these small, inexpensive, handy tools will do. A bur (or rotary file) can be shaped to do a particular job and reach that difficult place. Often a bur driven by a flexible shaft will do work that otherwise would be impossible or highly expensive. Burs do a better job than hand files, with a fraction of the effort.

Keller Burs are well made. Rigid specifications control their material, manufacture and heat treatment, so that each bur conforms to the high standards established. Every bur is particularly suited for the job it must do.

Tell us your finishing problems. When you need burs, think of Keller Burs made by P&W.

PRATT & WHITNEY DIVISION

Niles - Bement - Pond Co.

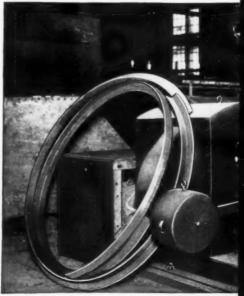
HARTFORD, CONN., U. S. A.

KELLER SALES DEPARTMENT



"Buffalo

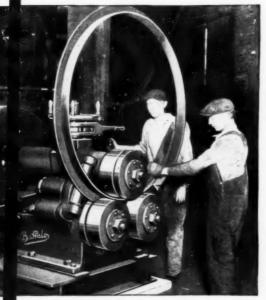
HORIZONTAL AND VERTICAL



All Buffalo bending rolls are of the single housing type with overhanging rolls, so that finished circles may be removed without dropping one housing. Lower rolls are placed close together to reduce straight ends on finished circles. Guide rolls are adjustable. Famous patented Buffalo "Leg-In" attachment is available on all models.

BENDING ROLLS

For Curving Flats, Tubes, Bars, Beams and Channels—Leg In or Leg Out



Five Models for All Bending Jobs. Send for Catalog

BUFFALO FORGE COMPANY

161 Mortimer St., [:-: -:- Buffalo, N. Y. In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



BUY QUALITY

Ask For Catalog

The AVEY DRILLING MACHINE CO.

1905



FLEXIBLE SHAFTS MACHINES

HIGH QUALITY ONLY -

SCREW DRIVING AND NUT SETTING MACHINES

We Build Machines In Vertical and Horizontal Types 1/8 to 2 H. P. Capacity



You Get Quality Only When You Buy STRAND Equipment



Send for our Catalog-Sixty Types and Sizes

FLEXIBLE SHAFT MACHINES

Manufactured by

STRAND & CO CHICAGO 5001-5009 No. Lincoln St.



The New South Bend back-geared acrew cutting Lathes are used in leading manufacturing plants and machine shops for work requiring the highest accuracy and precision in production and tool work.

Write for general Catalog No. 96, giving details and full specifications. Sent Free Postpaid.

SOUTH BEND LATHE WORKS 764 E. Madison St., South Bend, Ind., U. S. A.

PRICES OF OTHER POPULAR SIZES



| Size and Type Lathe | Between Centers | | Less C'shaft | Motor Drive |
|-----------------------------|--------------------|------|-----------------|----------------|
| 9"x31 Workshop Bench Lathe | | 320 | \$ 75.00 | \$103.25 |
| 9"x31 Junior Lathe | 16% | 600 | 172.00 | 278.50 |
| 98x31 Standard Change Gear | 16% | 655 | 227.00 | 322.00 |
| 9"x31 Quick Change Gear | 16% | 655 | 267.00 | 362.00 |
| 11 x4' Standard Change Gear | 24* | 920 | 294.00 | 452.00 |
| 11"x5" Quick Change Gear | 36* | 990 | 346.00 | 504.00 |
| 13°x41 Quick Change Gear | 16* | 1410 | 388.00 | 581.00 |
| 15 x5 Quick Change Gear | 24½* 34* | 1460 | 454.00 | 694 00 |
| 168-61 Quick Change Gear | 34* | 2230 | 537.00 | 779.00 |

SOUTH BEND Precision LATHES

Whitney Punches

Standard Equipment for Any Job

"World's Leading Manufacturers of Punches and Shears"



Capacity 1/8 inch aluminum rivet. Spindle travel 13/16 inch. Made in 5 sizes, with throat depths from 11/4 to 6 inches.



No. 10 Ball Bearing Punch

Capacity % inch through ¼ inch iron. Depth of throat 1% inch. Height of throat % inch. Furnished with one punch in any size from 1/2 to 1/2 by 1/32.



Angle Mitre Notcher and Angle Iron Bender

Capacity 2"x2"x1/4" angle iron or smaller. A pair of tools that every shop ought to have. They are Nos. 50 and 51 in our catalog.

ROCKFORD.



No. 4 Angle Iron Shear

Capacity 2"x2"x1/4" angle iron or smaller

Write for catalog on punches, shears, angle iron machinery and bending and box brakes.

NEY METAL TOOL CO.

ILLINOIS

do better work and save money with

S. S. WHITE

SUPER-QUALITY

CUTTING and GRINDING TOOLS

Because of their exceptional quality and accuracy of construction, S. S. WHITE Burs, Abrasive Points, Disks and Wheels and other small cutting and grinding tools, cut faster and cleaner than ordinary tools of this character, and last longer. Try them, and you will understand why so many tool makers prefer them.



WRITE for CATALOG T A which shows the wide selection of shapes and sizes, and includes price list.

The S. S. WHITE DENTAL MFG. CO. INDUSTRIAL DIVISION

10 East 40th St., Room 2310H, New York, N. Y.



SPOTLIGHTS

Places Light Where It Is Needed

Models for Office, Factory, Drafting Rooms, etc., all carried in stock. If your Dealer cannot supply you, please write direct.

Catalog furnished on request.

\$3.50 in single lots Price \$3.25 in lots of six F. O. B. Factory

CHICAGO DIE CASTING MFG. CO. 2502 W. Monroe St., Chicago, Ill.



NEW AG3-M



WATER PUMP CENTRIFUGAL

SPECIFICATIONS

14 H. P.—BALL BEARING—1725 R. P. M. MOTOR 25 GALLONS PER MINUTE WITH 10 FT. HEAD— RON BODY—BRONZE IMPELLER—

TENSION PACKING—
HT OR PRIMING COVER OPTIONAL—

CONSTRUCTION PERFORMANCE

DESIGN

FULFLO SPECIALTIES COMPANY, INC. BLANCHESTER, OHIO

MODERN

HENRY & WRIGHT DIEING MACHINES

For HIGH SPEED PRECISION STAMPING OPERATIONS

Completed parts

High Speed

Extreme

Exceptional Die Life

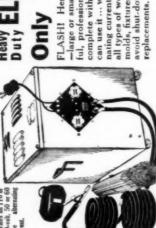


Designed for high speed precision stamping work, this DIEING MACHINE produces completed stampings at each stroke. One H. & W. DIEING MACHINE will replace a battery of ordinary presses.

Write for Catalog A-3

The Henry & Wright Mfg. Co. HARTFORD, CONNECTICUT

20-volt. 50 or 60 220-volt.



Only \$95.00 Complete with Accessories Heavy ELECTRIC ARC WELDER

FLASH! Here is "front page," sensational news for every shop —large or small—in the Machine Tool Industry. Now—a powerful, professional, HEAVY DUTY Arc Welder at only \$95.00, complete with all accessories. Safe, simple, portable ... anyone can use it ... works on 110-volt or 220-volt, 50 or 60 cycle alterall types of welding. Repairs castings, machine parts, tools, jigs, molds, fixtures, etc. Also invaluable as a maintenance tool to avoid shut-down delays while waiting for expensive repairs or nating current ... costs but a few cents an hour to operate. Does

Fully Guaranteed

The THOR can pay for itself on its first job or two. Ends sub-letting EQUALS WORK OF \$150.00 TO \$1500.00 EQUIPMENT!

welding jobs-keeps all the profits in your shop. Any of your mechanics can I llow our simple instructions about making all kinds of welds and EARN PROFITS FOR YOU. Amazing details...FREE! Send today for amazing de-tails about Thor Electric Arc Welder at only \$95,00, complete with You are not obligated in any way. Just write. accessories.

THOR WELDER FACTORY, Dept. M-603,

The THOR Electric Arc Welder is a revolutionary new kind of patented Arc Welder that is CUS ARANTEED to do 311 the patented Arc Welder done with electric arc welders conting \$50.00 to \$1400.00 more. Consider this list of THOR features, many automatically stabilized arc, fine adjustment, nine stares of heat control, modern simplified design, welded steel construction, portability, smooth performance, durability, ease and of which are EXCLUSIVE! High efficiency, uniform current speed of operation, and low price.

Union Levee at Winter St., Cincinnati, Ohio



No two workmen measure the same thing exactly alike

One measures roughly and another precisely.

That is why FEDERAL DIAL INDICATORS are being used more every day.

They eliminate human variations

Send for special folder showing uses Bulletin No. 43.

FEDERAL PRODUCTS CORP. 1144 Eddy Street Providence, R. I.

LOOK AT THIS NEW TAP HOLDER

SMALLER LIGHTER MORE ACCURATE MORE SENSITIVE

POSITIVE DRIVE VISIBLE DRIVE HEAT TREATED HARDENED GROUND

> SAVE TAP BREAKAGE INCREASES PRODUCTION

TAPPING **PROBLEMS**

VANISH IN THE **FOOTSTEPS** OF THE NEW

PROCUNIER "TRU-GRIP"

TAP HOLDER-THE MOST **SENSIBLE** TAP HOLDER THAT EVER GRIPPED A TAP-FURNISHED ON NEW STYLE "E" HIGH SPEED **PRECISION**

TAPPING ATTACHMENTS

SEND FOR FULL DETAILS

So. Clinton St.,

SAFETY CHUCK 0-0 2-2

Chicago, Illinois

THIS STOCKROOM **COSTS NOTHING**



STACKBIN sections give you a convenient stockroom - anywhere in the plant you want it. And this STACKBIN stockroom costs you nothing to construct. Costs you nothing to move. And has these other advantages:

The individual strong steel bins or sections can be carried to benches, machines, and back. They are great time and labor-savers in assembling, production, in the tool crib or in laying out toolwork. STACKBINS nest together to make a unit any size you want. They are neat, compact, free from splinters and broken edges, and have perfectly smooth interiors.

It costs you nothing to see how STACKBINS can cut YOUR handling costs. Send the coupon to-day.

> STACKBIN CORP.



STACKRACKS Keep Your Boxes Handy

Welded steel STACK-RACKS allow you to pile tote pans or shop boxes ceiling high, and still keep each one accessible without disturbing the others.

| STACKBIN | CORP. |
|-------------|-------|
| 56 Troy Str | eet, |
| Providence, | R. I. |

Without obligation, send literature on STACKBINS STACKRACKS for boxes, size(outside dimensions).



ROTOR GLEVELAND, OHIO

Facts about results!

HITCHCOCK'S MACHINE TOOL BLUE BOOK

Leads in Every Way

The letter on the opposite page is from a well-known company which advertises in 14 publications in the industrial field.

The "Blue Book" consistently leads them all-

- (1). In the number of inquiries
- (2). From well-rated concerns
- (3). At lowest cost

Any manufacturer of machine shop equipment should make the fullest use of a medium which leads in quantity and quality of inquiries, at lowest cost. The "Blue Book" leads a list of 14 publications in the industrial field.

Read this letter!

SKIILSAWING.



3310-20 ELETOW AVE

HITCHCOCK PUBLISHING COMPANY, 508 S. Dearborn St., Chicago, Ill.

October 13, 1936.

Gentlemen:

ATT: Mr. R. C. Van Kampen.

We have just been reviewing the results of our advertising campaign this year, preparatory to making up our 1937 schedules, and we feel that you are entitled to this letter commending the pulling power of your publication and the fine spirit of cooperation which you have shown us throughout the year.

You will be glad to hear that we have received more inquiries at a lower cost from Hitchcock's Macnine Tool Blue Book than from any other publication on our schedule. All inquiries have been from well rated concerns and, in two instances, we received actual orders for SKILSAW DRILLS direct from an advertisement. Naturally, our advertising appears on a consistent monthly schedule because we feel that the cumulative effect of such an uninterrupted program makes our advertising much more effective.

It gives us real pleasure to tell you this, especially since we have never before written such a letter to any publication. You may be sure that SKILSAW advertising will continue to appear in your pages next year.

Yours very truly,

SKILSAW, Inc.

E. W. Ristau,

Sales Manager.

EWR: PK

FOR PRODUCTION . MAINTENANCE . CONSTRUCTION BRANCH OFFICES NEW YORK 210 K 40th STREET -LOS ANGELES 312 OMAR AVENUE CABLE ADDRESS SEILSAW CODE BENTLEY'S SECOND - SALES & SERVICE IN PRINCIPAL CITIES

IN NEARLY A HUNDRED DIFFERENT WAYS

Street, Chicago.



Haskins Flexible Shaft
Equipment Cuts Cost and Speeds Up Production
And additional uses are being discovered all the time.

Light, portable, quickly moved wherever needed . . . as easy to use as a hand tool . . . permits the use of tools and grinding wheels in hard-to-get-at places—that's why Haskins flexible shaft equipment is cutting costs and increasing production in thousands of plants in every major metal working industry. It can do the same for you, too! Send for illustrated booklet showing many different adaptations and actual operation pictures. See how this modern, time-saving, money-saving equipment can solve many of your production problems. R. G. Haskins Company, 4654 W. Fulton





GET This New CATALOG

BETTER END MILLS by PUTNAM

Here is the new catalog No. 3, 30 pages of valuable information on PUTNAM'S complete line of finest precision tools, including several important new money-saving tools that deserve your careful consideration. The specialized experience of PUTNAM engineers allows us to guarantee these tools unconditionally and to warrant them fully as to quality of material and workmanship.

WRITE to us today Ask for Catalog No. 3

Putnam Tool Co. Detroit, Michigan



"EVERY PART in STOCK

Except the Holes"

Ettco-Emrick TAPPING HEADS



FOR SMALL TAPS

Sensitive High Speed Multiple Spindle

Reported savings chalk up from 100% to 500%.

Send for Bulletin No. 3 Today!

MULTIPLE Tapping, the ETTCO way, has proved successful. Taps break less often, wear longer and cut more accurately. You have the advantage of assembled units making up a head from stocked, standardized, interchangeable parts. This means a better job, better service and half the cost of heads made one at a time in the toolroom.

ETTCO TOOL CO., 598 Johnson Ave., BROOKLYN, N. Y.

THE NEW WYCO "JUNIOR"



SERVICEABLE for Grinding, Polishing, Drilling, Filing, Sanding, etc.

Made in Two Sizes-1/4 and 1/3 H. P. Made in Three Styles-Bench Type, Suspension Type and Floor Type.

Prices from \$25.00 to \$38.00 Complete with Accessories!

Outlasts Any Set Of Hole Saws

For electric drills, drill press or brace. Now made in two sizes!

Quicky adjustable-**High Speed Tool Bits**

Size No. 2½, adjust-\$2.50 able from % to 2½

Size No. 41/2, adjust-\$4.50 able from 11/4 to 41/2

ASK

for new catalog con-cerning the profit pro-ducing WYCO line.

STAFF.

642 W. Washington Blvd.,

Chicago

KRW Hydraulic and Sensitive ARBOR PRESSES

New Improvements, Special Built-in Features and Lower Prices make them an outstanding value.

THE last word in convenience, efficiency and case of operation. Built extra strong and well-braced, with steel trusses electrically welded, these preases will withstand strains that would cause presses of lighter and inferior construction to buckle or collapse.

Hand wheel for sensitive press operations has sliding handles which pull out to the ends for increased leverage. Work does not have to be changed from the work table as is the case with other make presses having a separate sensitive press unit mounted on the side or elsewhere.

The importance of this K R W feature as a time and labor saver can be appreciated. Also stere is NO EXTRA CHARGE for this important built-in feature on a KRW Press. Work table can be raised easily with one hand. A strictly one-man Press.

Write for special circular, just off the press, giving full details and specifications of all KRW Arbor Presses.



K. R. WILSON

10-16 Lock Street, Buffalo, N. Y., U.S.A.

EXPORT DEPARTMENT 90 West St., New York, N. Y. WEST COAST BRANCH 722 Mateo St., Los Angeles

Replace Obsolete Drill Presses



with this New 17 in. DELTA DRILL PRESS

Here's the way to reduced operating costs and increased efficiency! Check the many unusual features of this new 17 inch Delta Drill Press. Note its low price. See it in action at the nearest Delta dealers, then bring your shop up to date with this efficient low-cost tool.

Five Speeds: (385, 600, 935, 1450, 2240 R P.M.). Floating Drive: Pre-loaded double-seal ball bearings: 16 tooth splined spindle: Table-Raising gear: Head-Raising gear: Head-Raising seriling or production table: Completely enclosed belt: Safety spring wind: Foot power feed. Separate drill press heads available.

Write for full details and complete descriptive literature

Overall dimensions 66' high; 18' wide; 27' front to rear, Tilting table 11' by 12'. Production table 12'½' by 17' surface. Floor base 10' by 13¾' table surface. Shipping weight 450 lbs.

With motor pulley

and belt, but

without

DELTA MANUFACTURING CO.

631 E. Vienna Ave.,

Milwaukee, Wisconsin

Henry & Wright Dieing Machine

The improved Henry & Wright dieing machine shown here includes features which are said to greatly widen its application. Designed and built specially for use of progressive dies at high speeds, this machine combines piercing, blanking, drawing, forming, extruding and embossing operations at a single stroke,

each stroke of the machine thus producing a completed part, the operation of the machine being continuous.

Recent developments in progressive dies, together with special features as to stroke, feed and auxiliary attachments, now make possible the automatic production of highly intricate stamped parts in a single operation. One dieing machine can thus replace a number of



presses of the conventional type.

This unique press has a crankshaft located below the die bed, the angular thrust of the shaft being absorbed on a lower crosshead or slide and the punchcarrying member being pulled downward by guided rods. The true vertical movement which results, together with precision limits to which the machine is built, makes possible exceptional die life even where

dies are of intricate design.

A variety of sheet metal parts is produced upon these machines, ranging from simple blanks to intricate drawn and formed parts, operating speeds varying with the nature of production. An idea of production obtainable can be gained from the fact that precision razor blade blanks having tolerances as close as .0002" are produced at a rate of approximately 1000 per minute and close limit drawn parts at a rate of 200 per minute.

(Continued on Page 38)

DO IT-

Better—Faster—for Less!

with ODIN UNIVERSAL

Precision Vises Swivel and Plain

with Interchangeable Jaws and Hardened and Ground Parallels

They quickly pay their costs in savings on High Tool Costs —Expensive Fixtures —Patterns and castings—Extra Set-Ups.

> Investigate the money saving possibilities of ODIN VISES

Write today for full facts and prices,



Let us show you how to make cheaper and better jigs and fixtures at a greatly reduced cost—with a great saving in time.



Sales Division 110 S. Dearborn st., Telephone Franklin 3281 Normally furnished equipped with the standard Henry & Wright automatic double roll feed, this dieing machine, which is available in capacities from 10 to 300 tons, is also furnished with special feeds to meet individual requirements and with other auxiliaries such as automatic feeding reels, automatic power driven straighteners and automatic stackers.

These dieing machines are manufactured by the Henry & Wright Mig. Co., Hartford, Conn., who will

supply complete information upon request.

Vinco Improves Model B Dresser

The Vinco Tool Co., 7348 Central Avenue, Detroit, Michigan, has introduced a new model B-1 angle tangent to radius dresser which shows several improvements over the original model B.



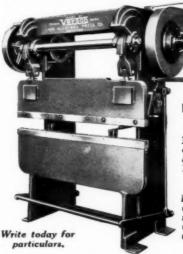
The new instrument has been redesigned with a hardened and ground ball race integral with the base, so that the index plate, which has been made larger with more legible graduations, revolves freely and the diamond holder post is free from any lost motion. Stops are also mounted on the index plate to permit quick and accurate setting of the dresser.

The diamond holder post has been fitted with a rack and is moved back and forth by a spur gear mounted on a shaft and rotated by a knurled knob which also serves as a handle to rotate the index

Improved Verson

ALLSTEEL

Junior Power Press Brake



Made in 6 sizes

Junior line has capacities up to and including 10 ga. by 6 ft.

All models furnished complete with motor and starter. Varidrive at slight extra cost.

Efficient and economical for production work

This light, powerful Verson press was specially designed for the rapid and economical production of sheet metal parts. Rigid, compact and easily portable, it pays for itself with savings in operating costs.

The Allsteel Press Company, Inc. 12017 S. Peoria St., Chicago, III. plate when it is positioned on dead center by the stop pins. Both rack and gear, as well as other moving parts of the mechanism, are fully enclosed and dust proof, to insure the most accurate settings possible.

The manufacturer will send literature and other information on request.

Grant Has New Chamfering Machine

The Grant Mfg. & Machine Company, Bridgeport, Connecticut, have brought out a new No. 283 double-end automatic chamfering, facing, and burring machine which will handle work up to 2½" diameter and from 34" to 6" long inclusive.

Machine illustrated is set up for finishing both sides of 1¼" nuts. Magazine type feed is used requiring

the operator only to place the nuts in magazine, after which they fall by gravity into feed fingers, where they are automatically pushed into position between clamping jaws, automatically clamped, the machining operations performed and finished parts automatically ejected.



Spindles are made from chrome-nickel steel.

heat treated, and run in bronze bearings. The bearings on each spindle are over 16" long. There are fine adjustments for spindle movements, also cam adjustments for spindles. Cams are drum type with removeable plates. Cam shaft has a safety feature to prevent breakage. The machine is equipped with silent chain drive from motor to spindles and with change gears for both spindle speeds and feeds.

Provision is made on the front of the machine for a crank handle which is used for setting tools.

All bearings are automatically oiled with forced feed lubricator.

The manufacturer will supply literature and additional information on request.

40



Use SUNDSTRAND 3-WHEEL TOOL GRINDER It Grinds—It Hones

Saves Time and Money-Increases Production

The Sundstrand 3-Wheel Tool Grinder creates correct cutting angles accurately; grinding high-speed steel, stellite or tungsten carbide is rapid,—honing then

provides the finer edge which increases production and tool life between grinds, maintains fine finish. Sundstrand 3-Wheel Tool Grinders pay for themselves by increasing the productive capacity of the machines on which the tools are used. Investigate.

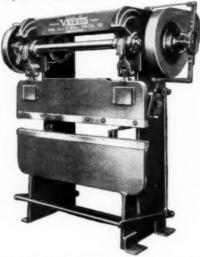
Write today for Bulletin Gr-735 -



Sundstrand Machine Tool Co. 2535 Eleventh St., Rockford, Illinois

Junior Press Brakes

A new line of Verson Allsteel junior and heavy duty junior press brakes has been developed to meet the demand for a fast, powerful and economical unit in the sheet metal industry. These brakes were designed for bending, forming, notching, piercing and other press brake operations now being done on larger, more expensive machines.



The entire line includes six sizes. The smallest will bend 14 gauge metal, 52" long, while the largest one has a capacity of 14 gauge metal. 78" long. All sizes are furnished complete with driving motor, starter, "V' belt drive and die holder. They are light enough to be moved to the job, and heavy enough to insure sharp straight bends the full length of bed and ram.

Bed and ram@re provided with a sectional die clamp, while the bed is equipped with a die holder. Dies can be changed in a few minutes, it is said. The two-

HAMMOND

GRINDERS & POLISHERS



Hammond Michinery Builders

plate bed allows the use of gang punching. The rams can be elevated from either side, individually or together.

The main bearings are of the split cap design and transmit the entire load centrally to the main housing plates. The mains and intermediate backshaft are bronze bushed, while the clutch shaft and flywheel are mounted on self-contained ball bearings.

All bearings are provided with Alemite fittings.

Gibs in the larger press brakes are of the square type design and hold the ram and housings in absolute alignment at all times.

All gears and pinions are of steel, well guarded all

around.

The drive is through "V" belts, completely guarded. Standard machines operate at 40 strokes per minute, but any press can be equipped with a variable drive transmission, so that any number of strokes between 17 and 50 can be easily attained by turning an adjusting wheel. The speed can thus be regulated, it is claimed, to suit every possible condition which might arise in high speed production.

Complete information may be obtained by writing to the manufacturer, the Allsteel Press Company, 12015

S. Peoria St., Chicago, Ill.

New Inserted-blade Milling Cutters

Faster, more accurate production with a distinct saving in tool cost is claimed by the O. K. Tool Co., Shelton, Conn., for a new line of inserted-blade milling cutters recently placed on the market.

The illustration shows how the new O.K. blades lock firmly in place without screws, pins or wedges. This allows for closer tooth spacing when necessary. The mating serrations in the blade are intended to permit adjustments in the line of



wear. This two way adjustment makes it possible

Each has its own enthusiastic following

SHANK TYPE



This sturdy holder with roundshank bit, representing over 30 years' development, is still in regular demand where the work does not require the flexible bit adjustment of the present-day O. K. design. Hence, these original tools are always in stock. In this type, the bit drops naturally into true cutting position, where a turn of the wrench secures it as solidly as though bit and holder were integrall

SHANKLESS TYPE

Here the bit has a serrated under-face, which meshes with serrations in the seat of the holder. By loosening the locking clamp, bit may be moved side-wise, to compensate wear.

All O. K. Tool Holders are of alloy steel. The bits are of high speed steel, and are available for all metal cutting jobs. Further details on request.





SYSTEM

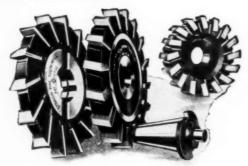
THE O. K. TOOL CO.,

SHELTON, CONN., U. S. A.

to preserve the width and circumference of the orig-

inal tool as long as the blades last,

The body of the cutter, according to specifications, is made of chrome-nickel steel, heat-treated, and the blades of drop-forged, high speed steel. Since only the blades are made of the more expensive steel, and are the only parts to be discarded when worn, much waste is eliminated.



The O.K. inserted-blade principle is obtainable in milling cutters and in single point tools such as are used on lathes, planers and boring mills. The manufacturer will supply detailed information and prices on all inserted-blade tools on request.

New Universal Electrodes

A new electrode, Universal Easyweld, specially designed for the popular transformer type are welders, is announced by the Universal Power Corporation, 4300 Euclid Avenue, Cleveland, Ohio.

Easyweld permits the arc to be very easily started and maintained, is said to do a dependable job on all repairs and maintenance work on steel or iron and to

be ideal for light gauge steel welding.

Easyweld electrodes are of the protective shielded are type, and produce weld metal of 55,000 to 65,000 pounds strength with a ductility of 15% to 20% elongation in two inches.

The New B-1 VINCO

Angle Tangent to Radius Dresser



The new "B-I" Dresser has several improved features. It is our model "B" redesigned to suit the needs of manufacturers of production parts. Feature (1) It has a hardened and ground ball race integral with the base. The index plate rotates freely on precision balls securely locked in position under load. This makes the diamond holder post rigid and free from any lost motion, thus insuring accuracy. Feature (2) The "B-I" Dresser is fitted with stops mounted on the index plate and fully enclosed so that dirt cannot interfere with their accuracy. The dresser can be set at any given angle quickly and accurately. Feature (3) The index plate has been made larger, making it easier to read the graduations, better the set of t

Send for descriptive circular

VINCO TOOL CO.

7348 Central Ave.,

Detroit, Mich.

Wyco Announces "Junior" Line

Wyzenbeek & Staff, Chicago, Ill., manufacturers of Wyco flexible shafts and other tools, have announced a new line of economical flexible shaft machines designed to handle short jobs and occasional work which cannot be handled profitably with larger machines.

The smallest size of this new line is a ½ h.p. machine with a four-foot shaft. These "Junior" shafts are similar in design to the regular Wyco line and are also equipped with Wyco's non-metallic inner liner.



The heavier of the "Junior" models is a ½ h.p. machine with a five-foot shaft having a ¾-inch inner core. This size is said to be suitable for hard, continuous work within the range of the machine. A wheel arbor and a ¾-inch drill chuck are furnished as standard equipment with both sizes. The handpieces of these shafts have the same size spindle as the heavy duty Wyco types and fit all the accessories of the Wyco line.

Both sizes of the "Junior" machines are available in floor type, suspension type and bench type models. Additional information and prices are contained in

a new catalog which will be furnished on request by the manufacturer. Address Wyzenbeek & Staff, Inc., 642 West Washington Blvd., Chicago, Ill.

REDUCE TOOL ROOM AND PRODUCTION COSTS WITH -

Atlas. DRILL PRESSES AND TAPPING MACHINES

Low cost Atlas drill presses and tapping machines now enable you to have several machines where before the cost was prohibitive.

The Atlas 62 and 72 drill presses can be converted into sensitive, high speed production tapping machines at small cost. The 72 floor model drill can also be equipped with foot lever feed control to speed up all operations.

Atlas tapping machines are built for precision tapping at high speeds. Construction supplies both "through" and "bottom" tapping and assures smooth sensi we feeding. Prices are from \$89.95 to \$104.95 complete, I=18 motor, luvestigate these values. Write now,







New 1937 Atlas catalog now ready. Shows the latest in lathes, arbor presses, drill presses, tools and attachments. Send for your copy today.

ATLAS PRESS CO., 1150 N. Pitcher St., Kalamazoo, Mich. CHICAGO—35 E. Wacker Dr. NEW YORK—130 W. 42nd St. PHILADELPHIA—113 N. 3rd St.

New Whitney Abrasive Cut-off Machine

A new abrasive cut-off machine that will cut any mitre by adjustment of the wheel head radially on the column has been introduced by the Whitney Metal Tool

Co., 101 Mill St., Rockford, Ill.

The new machine has found good use in cutting tubing, angles, channels and hollow shapes that are made from thin metal that will strip the teeth from a hacksaw. It will also cut glass, porcelain, and stone, according to the manufacturers, as well as various plas-

tic materials.

The unique design of the new machine, which is shown here, includes a universal wheel head and a universal angle vise that makes it possible to cut materials at any combination of simple or compound angles. For cutting copper and other soft material a steel saw can be used in place of the abrasive wheel with equally satisfactory results. It is especially useful in cutting small samples of metal for test purposes.



The cut-off wheel swings forward and down from a point of radius that is about 45 degrees from a horizontal line at the vise. In this way the abrasive wheel penetrates the work without cutting through a flat surface which will cause burning. If the material is of such a shape that the wheel must cut through a flat thin surface, the vise can be adjusted to roll the work to a position that will allow the wheel to cut across the narrowest way.

The universal feature of the head assembly makes it possible to cut angles without swinging the material.

When the machine is used for dry cutting the tub shaped casting that holds the vise may be filled with water to stop sparks and abrasive material. When the machine is used with coolant this casting catches the liquid and returns it to the coolant tank and pump.

The cut-off wheel is 10 inches in diameter by 3/32 inch thick and is well guarded. The wheel arbor or spindle runs in precision type ball bearings and is driven PRECISION contour sawing — filing and polishing requires that this machine tool be as rugged as a milling machine and as accurate as a precision bench lathe. That is why all castings are seasoned nickel-iron, eight SKF bearings are installed and all sliding parts are hand fitted.



CONTINENTAL MACHINE SPECIALTIES, INC. 1301 Washington Ave. South, MINNEAPOLIS by a V-belt from the motor. These parts are assembled as a unit and counterbalanced with an adjustable spring that will return it to its out of the way position when not in use.

Several features of the vise are noteworthy. The pressure of the jaws against the work is by spring tension to reduce the danger of marring or collapsing frail shapes or tubing. Both pressure and movement of the jaws are controlled by right and left and up and down movements of a ball handle. The front jaws are stationary and clamping is done by the rear jaw. This provides a stationary, rigid support for the work against the wheel pressure. A slot is provided in the center of the vise so that when straight cuts are made the work can be supported on either side of the cut. The vise is mounted on an accurately machined table located with a tongue block and keyway. This permits sliding the entire unit right or left from the center, and the corners of the vise are cleared to permit the wheel to pass very close to the edge of the front jaw for cutting both right and left mitres. The upper portion of the vise is mounted on a cradle having a tilting action that serves two purposes; for making straight cuts on an irregular shaped material it can be adjusted so that the cutting off wheel will make the cut through the narrowest portion of the work; and it also serves as a device for cutting compound mitres.

This new machine, known as model 37, has a 1 h.p. motor which operates at a speed of 3425 r.p.m. to produce a spindle speed of 4800 r.p.m. The vise jaws are 4½ inches long and 1 inch high, with a maximum opening of 1½ inches. The vise table is 4 inches by 8½ inches with a 5½ inch keyway. Prices and literature may be obtained by writing to the manufacturer.

Reynolds Machine Company Reorganized

The Reynolds Machine Co., Massilon, Ohio, well known for many years as manufacturers of automatic screw driving machines, has been reorganized under new management. The company will continue to manufacture various models of belt and motor driven screw driving machines and to supply parts and service for all types of Reynolds equipment. It is estimated that close to 150,000 Reynolds machines are in use throughout the country.

If it's better at these 5 points
...it's one of the
SKILSAW DRILLS

SWITCH
MOTOR

BEARINGS

FRAME

HERE'S WHY

YOU SHOULD CHOOSE SKILSAW DRILLS:

- SWITCH—Has longer life because of 100% overload capacity and because all the mechanism is fully enclosed in bakelite housing.
- MOTOR—Its greater overload tolerance minimizes heat and lengthens life. Delivers more power under load.
- GEARS Helical cut gears of tougher, stronger steel last longer and run quieter.
- BEARINGS Highest quality ground and lapped ball bearings are grease sealed. They are mounted in all positions to compensate for radial and thrust loads, —to minimize friction and eliminate vibration!
- FRAME Die cast aluminum frame is more compact, lighter in weight and 50% stronger.

... and, in addition, SKILSAW DRILLS are faster, cost less to maintain, save more in operation ... yet their price is not higher! Made in 14 powerful models.

See Your Distributor and Write for Our New Catalog

SKILSAW, INC.

3304 ELSTON AVENUE, CHICAGO 218 E. 4008 St., New York—52 Breatilize Ave., Beston 312 Owine Street, Lee Augusta. Calles & Service for Canada. Bit Science Ave., Turnets.

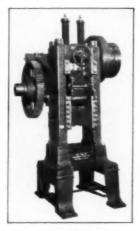
Toledo Knuckle Joint Coining Press

The Toledo Machine & Tool Company, 1420 Hastings Street, Toledo, Ohio, a division of E. W. Bliss Company, has recently announced the development of a new 150-ton tie-rod frame press to add to their popular line of knuckle joint presses for the sizing or cold

finishing of forgings and other coining, extruding, swaging and cold squeezing operations.

These presses range in capacity from 25 tons up to 2500 tons (the smallest is illustrated here). The features of the new press include the rolling key clutch, the tie-rod frame construction and a number of refinements in details of design and construction. The uprights, crown and bed are made of high tensile strength, pearlitic alloy castings and are held together by steel "shrunkin" tie-rods.

Previously this press was built with a solid frame, but the greatly increased advantage of the



tie-rod construction created the demand for the changeover. The ability of the rods to stretch, in case of a heavy blank or other mishap gives a needed measure of protection. Many of the smaller sizes are carried in stock and can be shipped on receipt of order. The operating speed of the geared press shown is regularly 43 strokes per minute.

Vertical Lever Tapping Machine

Illustrated on this page is a precision vertical lever tapping machine introduced by Sloan and Chace Manufacturing Company, Kearny, New Jersey, formerly of Newark, New Jersey.

(Continued on Page 56)

ERRINGTON HYSPD

Super-Sensitive Ball Bearing

Cone Drive

2 to 1 Auto-Reverse Tapping Chuck



| Size | Taps in Steel | Tape in Cast Iron | Price | Code |
|--------|------------------|----------------------|---------|---------|
| No. 00 | 0" to 3/16" | to 1/4" | \$35.00 | Phlam |
| No. 0 | to 3/8" | | \$50.00 | Phalanx |

The principle on which this Style is designed is especially effective on very small tapping; whereas in the No. 0 size the Frictional Grip is Greatly INTENSIFIED, to cover a wider range, without loss of sensitiveness.

Errington Mechanical Laboratory

Main Office and Works: STATEN ISLAND, New York
Chicago Office: New York Office: Boston Office:
6047 N. Talman Ave. 220 Broadway 930 Old South Bldg.

This machine is used in the manufacture of instruments, watch plates, meters, dials, radios, gauges, typewriters and other parts

requiring light tapping.

The pillar carries a swinging circular table, which is scraped perfectly true with the spindle and clamped in position by two screws. The head-stock is fitted to a reduced pillar diameter and held to the shoulder with a cap screw.

The spindle carries two shives, driven in opposite directions and mounted on a vertically sliding sleeve, actuated by a spring-lifted hand lever stopped in both up and down travels by screws tapped into the lever bracket. When the lever reaches these



stop screws it disengages the working shive, stops the spindle and prevents the work from climbing up and breaking the tap.

Tapping capacity at 2000 r.p.m. is No. 3 tap in

steel and No. 6 tap in soft metals.

For further details, write for literature.

New Non-Metallic Belt Lacing

Tek-Lace, said to give the safety, efficiency and durability of endless belting, plus the convenience, low cost and ease of application of ordinary belt fastenings is a new belt lacing used for fastening flat belts or V-belts.

Made of the strongest fibres known, Tek-Lace is only 0.055 inches in diameter, but has a tensile strength of 100 pounds—more than 50% stronger than Federal specifications for rawhide ¼" wide and ¾" thick. A three-inch belt fastened with Tek-Lace is said to have a tensile strength of 2000 pounds at the joint. The small holes that it requires are pierced through the belting without cutting the fibres, thus avoiding weakening of the belt itself.

WALKER — TURNER

TRIPLE - VALUE

In This Engineered

DRILL PRESS

\$50.45 complete with 1/3 H. P. A. C. Motor

BENCH MODEL No. D925

Nowhere else will you find a tool of this class, with so many quality features, at such a low price. That's value number one! The convenience of this drill press for many light production jobs allows you to release your larger equipment for heavier work. That's value number two. And the sturdiness that's evident in its appearance and operation is the third value.

Quality features: six-spline spindle for vibrationless operation. 4 SKF precision ball bearings. Jacobs (0* to 1/2*) Key Chuck. Pilot wheel feed,

calibrated depth stop, positive return spring action. Stop collar on column for head assembly. You may find some of these features in many tools, but look to Walker-Turner for all of them, combined in a precision tool at a low price!

Chuck to table, 12*. Chuck center to column, 7-1/2*. Chuck to base, 17-1/2*. Table 10*x9*, tilting. Spindle travel, 4*.

Write to-day for full details.

WALKER - TURNER CO., INC.

17116 Berckman St.,

Plainfield, N. J.

Engineered POWER TOOLS

The efficiency of Tek-Lace is due to its flexibility, it is claimed, and to the fact that it sets into the belt instead of standing out above the surface. The joint is thus as smooth and flexible as any other part of the belting. Pulleys and the lace itself are better protected from undue wear. The joint takes the curve of the pulley perfectly, and there is no slipping or bumping to interfere with the transmission of power.

A Tek-Lace fastening may be made by means of an ordinary awl or other piercing tool. For quicker application, however, a special piercing tool with gauge and channeling device is available. Sufficient Tek-Lace for lacing 15 three-inch belts sells for \$1.50. The piercing tool is priced at \$2.50. For further information, write Sudbury Laboratory, P. O. Box 932, South Sudbury, Mass.

M-B Air Line Filter Saves Trouble

A new combination of air line filter and lubricator developed by M-B Products, 132 E. Larned St., Detroit, Michigan, recently was placed on the market.

This unit has been tested by the manufacturer and approved for use with air valves, cylinders, controls, pneumatic tools and other devices using air which must be free of dust and other impurities. The assembly first removes dust. pipe scale, moisture and foreign matter from the air stream as it enters the filter and then saturates the air with the amount of oil desired. A valve at the top of the oil chamber controls the flow of oil from a glass reservoir in which the oil level is visible.



The M-B automatic air line lubricator and filter is available in capacities of 1/4, 3/4, 1/2, 3/4 and 1 inch with standard pipe tap inlet and outlet connections. Literature and other information will be sent by the manufacturer on request.



this can't be beat!

WELLS Metal Cutting BAND SAW is a continuous-cutting machine that will save from one-third to one-half in time and labor costs. Extreme precision, long blade life, ability to run without coolant, are advantages of the Wells metal cutting Band Saw that contribute substantially to reducing production and maintenance costs. Fully detailed information will be sent upon request.

Built in two sizes

No. 8 capacity 8'x16' No. 5 capacity 5' round or 10'x5'-cuts all kinds of tubing.

Wells Manufacturing Corp.

315 Seventh Avenue.,

Three Rivers, Michigan

New Low Cost Tap Chamfering Fixture

A tap chamfering fixture for sharpening any size and type of tap up to and including 1½ inches irrespective of number of flutes or shank length, is announced by the Detroit Tap and Tool Company, Detroit, Mich. The use of this type of fixture insures in the regrinding of taps, according to information, that they will be concentric with the shank and also eliminates difficulties in tapping arising from inaccurate flute spacing in regrinding.

Spring collets are used to hold and locate the tap in the fixture. This insures concentricity and eliminates difficulties in sharpening taps on which center holes have been ground away.



Fixtures can be mounted on any type of grinding machine in either a right or left hand position and are adjustable for height.

The amount of eccentricity or relief may be regulated by a graduated adjustment on the fixture. Thus the fixture also permits changing the amount of relief without using separate cams.

In grinding, a light pressure of the hand is applied to bring the finger against the stop on the fixture, while rotating the tap by means of the handle. The latter imparts to the tap an oscillating motion. The fixture is completely universal in character to accommodate all taps including taper, plug, and bottoming types.

Ideal Concentric Coil Winding Head

A coil winding head of an entirely new type that winds single-phase-motor coils in gangs or groups up to six in a nest in all sizes and shapes, connected in

ALLOY STEEL CAMS

FOR AUTOMATIC SCREW MACHINES



Bullard Cams . . . of alloy steel . . . only the path of the roller is hardened about 1/4" deep, body is left soft. If cam has to be placed in new position on drum, holes can easily be drilled.

Cut Off and Form Cams ... of special alloy steel ... will absorb any shock, leads are milled accurately, insuring longer life to cutting tools.





Lead Cams with alloy steel face for longer life and accuracy. A comparison of this type cam against other makes proves it is far advanced in principle and lower in price.

It will pay you well to check up on MODERN Products. These and many other screw machine equipment items are described in our new catalog.

WRITE FOR IT.

COLLET & MACHINE

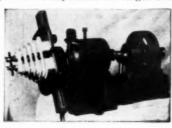
ECORSE, MICH.

series, so that they can be removed together and inserted in the stator without series soldering is being announced by the Ideal Commutator Dresser Company, Sycamore, Illinois.

The new head, which is adjustable for length and

width of coil, can be set up for winding in from five to ten minutes.

The unit has a base with a scale on the side and a flange for mounting coil winder head on the drive. On this are mounted two adjustable



face plates with adjustable aluminum segments over which the coils are wound. Setting these segments for a given set of coils and clamping them to the face plates is said to be simple and fast work. An indicating mark on the face plates facilitates bringing them back to the original position instantly, if desired, after running a set of coils; therefore, it is not necessary to stock a multitude of forms for occasional runs.

New Rustproofing Liquid

"Ne-Ver-Rust," a new product for rustproofing metal parts that cannot be galvanized or protected by copper or zinc coatings, was introduced recently by the Never Rust Manufacturing Co., 1771 E. 18th St., Brooklyn, New York.

The new product is a thin, transparent liquid that enters and fills the pores of the metal, producing a non-porous film coating that is claimed to be impermeable by dampness or chemical action. A gallon of the fluid, it is said, will cover from 1,500 to 2,000 square feet of polished surfaces.

"Ne-Ver-Rust," according to directions, is applied with a brush and will dry sufficiently in a short time to permit handling. If it must be removed later, it can be dissolved and washed off with turpentine, since it does not harden like paint or tallow preparations. Literature may be obtained from the manufacturer.

LOOKS LIKE \$1,000,000

and RED D No. 65R Threader Performance is even better than it looks



early decided that a pipe threader might as well **look** handsome enough to inspire care, even if it didn't **need** special care. So you have this bright, rugged No. 65R Threader to take pride in. But at that your chief pride will

be in the smooth clean easy job of oipe threading it does. Threads 4 sizes of pipe with one set of dies, any pipe, any thread variation. New workholder sets to size mechanically and tightens with one screw. Thumb lever releases dies from threads when backing off and reverses ratchet. Straight line action, handle to dies, no cock or wabble. You'll like it.

Ask your jobber.

The Ridge Tool Co., Elyria, Ohio, U.S.A.



Pipe Wrenches

Cutters

Threaders

Vise

Extractors

Challenge Cut-Off Machine

The Challenge Machinery Co., Grand Haven, Michigan, has recently marketed a new abrasive cutoff machine intended for use with any metal, hard or soft. The new machine is said to cut hardened tool

steel easily and quickly.

The machine is a self-contained utility unit in the moderate-price class and has a capacity for metal up to one inch in thickness. The table is adjustable and measures 15 by 14 inches. Gauges are conveniently located and easily adjusted. The base is cast iron.



The machine comes equipped with a 6 by 1/32 by ½-inch clastic cut-off wheel mounted on a precision ball bearing spindle and with either 110 or 220-volt single phase a.c. motor which will operate from any

light socket.

Literature and complete specifications may be obtained by writing directly to the manufacturer.

New Catalogs and Booklets

A new catalog of arc welding equipment and accessories issued by the Universal Power Corp., Cleveland, Ohio, illustrates several types of helmets and face shields, goggles, leggings, anklets, gloves, aprons and other protective devices for men who work with arc welding machines.

This catalog, which also contains price lists and information on standard arc welding supplies, may be

obtained by writing to the manufacturer.

. . .

The Titan Tool Co., Fairview, Penna., has just published a catalog illustrating a new kind of stud setter which they recommend as being highly efficient.

The new stud setter, a power-driven unit, employs a controlled drive with a safety clutch which allows the setter to drive studs to a uniform degree of tightness without straining or mutilating the threads.

A copy of the catalog will be mailed on request.



Flush type drives in



Low clearance type

Tucker Oilers

Made in styles for every machine. Cut from brass rod, with die cut threads. Special oilers made to order.

Write for catalog.

W. W. & C. F. Tucker, Inc. 612 Capitol Ave., Hartford, Conn. "Established 1899"





This Slide-Rule



FREE to responsible firms

¼ actual diameter

Please submit requests on firm letter head.

This slide rule automatically calculates weight per 1000 pieces or pieces per pound of any size washer in any material, including steel, brass, copper, aluminum, fibre, paper, etc., etc.

Write for our catalog material listing thousands of washers and stampings having application in all types of manufacture and assembly.

"The World's Largest Producer of Washers"

WROUGHT WASHER MFG. CO. 2224 South Bay St., Milwaukee, Wis., U.S.A.

Latest publication to be distributed by the Landis Machine Co., Waynesboro, Penna., is a new Operator's Instruction Book covering Landis pipe threading and cutting machines and Landis stationary die heads. The booklet is available free of charge.

* * *

A new line of portable cranes with telescopic or hinged frames and revolving bases is shown in a folder which will be sent on request by the Lewis-Shepard Co., 177 Walnut St., Watertown, Mass. Ask for booklet 506.

Doall Etching Pencil

A new "electric pencil" known as the Doall etcher has just been placed on the market by Continental Machine Specialties, Inc., of Minneapolis, Minnesota.

Writing on steel with the electric pencil is a process of arc welding in which the tip of the pencil vibrates to permit the miniature arc to be interrupted and produce the etching ef-

feet

In the Doall etcher an entirely new principle is used to accomplish the vibration of the pencil point. A special coil in the pencil is attached directly to the writing point, which is made of pure tungsten to resist heat and wear.

The pencil shown here is operated from the transformer built into the company's Doall sawing, filing and polishing machine. The principal function of this transformer is to weld or braze the precision metal



cutting band saws used in the machine. The brazing transformer is especially suited to the requirements of the electric pencil, because it has a low voltage and high amperage; the current being regulated with a 3-"heat" switch, shown in the lower illustration. Thus any desired degree of intensity for the etching arc may be attained.



LASALLE REAMERS

For Economy-Accuracy-Long Life

LaSalle high speed steel screw machine reamers are made with five standardized shank sizes to fit all standard floating holders. Uniform length and ample chip clearance produce best results.

Write for catalog of sizes and prices.

Machinists Tool Grinding Co. 3038 Van Buren St., Chicago, Ill.



Timesaver Lapping Compound

Produces

Perfect Fits-Quiet Operation

Timesaver Compound is easy and economical to use.

Eliminates hand scraping and long running-in operations.

Safe. It will not imbed or continue to cut.

Used by leading manufacturers for the past sixteen years for the fitting of all types of gears, bearings, valves, pistons, slides, etc.

Grades for hard and soft metals.

Send for samples and literature



A gear lapped to precision, in assembly, with Timesaver Compound

TIMESAVER PRODUCTS CO., 33 S. Desplaines St., CHICAGO, ILLINOIS

Baldor Introduces a New Grinder

The Baldor Electric Co. announces a new grinder, designated as their type No. 3240. This grinder is powered with a "Capacitor" type motor, which according to the manufacturer, will not burn out, even

though repeatedly overloaded.

The rating of the motor is ½ hp.,3450 r.p.m., single or three phase. Wheels are 7 inches in diameter, with 1-inch face, mounted on a heavy shaft with a 5%-inch arbor.



Other features mentioned by the manufacturer are closed guards, tapered end bells and clearance type motor frame which permits easy grinding of long or odd-shaped pieces. For additional information, write to the Baldor Electric Co., 4357 Duncan Ave., St.

Louis, Mo.

Luther Announces a New Radius Dresser

An improved system of radius dressing introduced by the Luther Manufacturing Co., 58 Knecht Drive, Dayton, Ohio, employs a fixed tool holder capable of

especially fine adjustments,

The radius dresser, which is illustrated here, is recommended by the manufacturer chiefly because of its simplicity, since the device has a minimum of parts and is rigidly constructed. This economical construction, it is claimed, has also made possible a lower selling price than is usual with wheel dressers of this type and has overcome the difficulty of maintaining ac-



(Continued on Page 70)

CHARD Twelve-Speed All Geared Lathes



Precision Timken or Plain Bearing Spindle. Instantaneous Start or Stop of Spindle. 12 Speed Changes in 15 seconds. Heat Treated and Hardened Gears run in Oil in Speed Box. All Shafts mounted on Ball Bearings.

All Shafts mounted on Ball Bearings.
Powerful, Accurate, and Easy Control.
Built in 16°, 18° and 20° Standard Engine
Lathes, Manfacturing Lathes and Tool Room Lathes.

Send for complete catalog No. 100.

DEALERS: Write for dealer proposition.

Western Machine Tool Works. Holland, Mich.

Ryerson Horizontal Drilling, Boring and Tapping Machines

Greatly Reduced Prices

These machines will handle the large difficult drilling and boring jobs easily—and the average run of work very efficiently. The moveable work table together with the great vertical travel of spindle permits work over an extremely large surface.

To reduce present inventory we are offering these machines at very attractive prices. Take advantage of this money saving opportunity. Write today for complete description, specifications and prices.

Joseph T. Ryerson & Son, Inc. Lock Box U, Chicago, III. curate adjustments when grinding wheels must fre-

quently be dressed.

Illustrated literature, prices and additional information concerning this instrument, which is known as the Little Wonder radius dresser, may be obtained by writing directly to the manufacturer.

Professional Drawing Stand

The drafting stand shown here is a new model of the well-known Wrigraph. The entire unit, according to the manufacturers, is made of oak, securely cross braced, and is stained walnut color. The draw-

ing board tilts 90 degrees and can be clamped at any angle with a unique clamping device which operates from the right side of the table. The height is adjustable from 33 inches to 45 inches. Large star wheels clamp the posts tightly, so that there is said to be no slipping.

The table is so constructed that it can be shipped in a flat carton. The legs can be assembled to the posts in a few minutes. The white pine board is 23 by 31



inches and is treated with shellac to prevent soiling.
Wrigraph drafting machines and drawing stands
are manufactured by L. G. Wright, Inc., 5207-12 Euclid Ave., Cleveland, Ohio.

A Correction

It was stated in the last issue of the "Blue Book" that the price of a 16-inch geared head Sidney lathe,

20-inch swing, is \$2,000.

We are informed by the Sidney Machine Tool Company that this is an error—that the price of the 16-inch Sidney sliding geared head 8-speed lathes, with head and tailstock, increased in swing to 20-inch, F.O.B. their factory at Sidney, Ohio, is \$1,347 each as standard machines.

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Fig. 2 Without Jig Attachments

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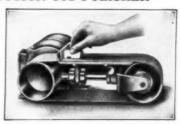
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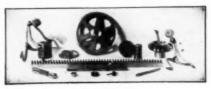
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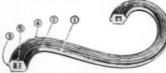
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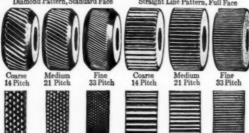
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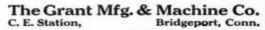


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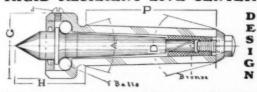
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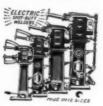
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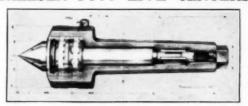
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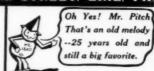
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Ford Motor Co., Jehansson Div., Dearborn,
Mich.
Gagus

Swedish Gage Co. of Amer., Detroit. Mich United Precision Products Co., 4618 W Huron St., Chicago, Ill

Gages, Chrome Plated Vinco Tool Co., Detroit, Mich.

Gages, Gears, Spur and Helical Vinco Tool Co., Detroit, Mich.

Gages, Pin, Plug, Ring and Snap American Tool Works, Inc., Hartford Conn. United Precision Products Co., 4618 W. Huron St., Chicago, Ill.

Gages, Taper Hartford Special Mehy. Co., Hartford, Conn. Vinco Tool Co., Detroit, Mich.

Cears
Abart Gear & Mche, Co., 4832 W 16th St.,
Chicago Gear Whs., 769 W. Jackson, Chgo.,
Massachusetts Gear & Teol Co., Weburn,
Taylor Machine Co., Cisveland, Ohio

Gears, Mosfer Vince Tool Co., Detroit, Mich.

Gear Motors Star Mche. & Eng. Co., Blesmfield, N. J.

Generators
Chicago Electric Co., 1838 W., 22nd St.,
Chicago, Bl.,
Star Mche. & Eng. Co., Bloomfield, N. J.

Grinders, Air M. H. Products, Detroit, Mich. Rotor Air Tool Co., Cleveland, Ohio

Griaders, Bench Balder Electric Co., St. Logis, Mo. Carrell Mig. Co., I. W., Chechnett, O. Bammond Machinery Builders, Kalamszoo, Standard Electrical Tool Co., Cincinnati O. Vonnegut Moulder Corp., Indianapolis, Isid.

Grinders, Disc Oliver Machinery Co., Grand Rapids, Mich. Standard Electrical Tool Co., Cincinnati, O. Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Grinder, Electric Chicago Wheel & Mfg Co , M, C, Tool Div., 1101 W Monroe St. Chicago, III. Shilbaw , Inc., 3304 Riston Av., Chicago, III. Standard Electrical Tool Co., Chicanati, O.

Grinders, Electric Bench Raidor Electric Co., St. Louia, Mö. Standard Electrical Tool Co., Cincinnati, O. Vailor Biectric Gorp., St. Louis, Me.

Grinder, Flexible Shaft Haskins Co., R. G., 4854 W. Fulton, Chgo. Mall Tool Co., 7762 S. Chicago Ave., Chicago N. A. Strand & Co., 5001 N. Lincoln, Chgo.

Grinding Machines, Floor Hammond Machinery Builders, Kalamazoo, Mich.

Grinders, Hand
Chicago Wheel & Mfg. Co., M. C. Tool Div.,
101 W. Monroe St., Chicago, Ill.
Rotor Afr Tool Co., Cleveland, Ohio
Skilnaw, Inc., 3300 Elston Av., Chicago, Ill.
Standard Electrical Tool Co., Cincinnati, O.

Grinders, Heavy Duty Vennegut Moulder Corp., Indianapolls, Ind.

Grinders, High Speed Chicago Wheel & Mig. Co., M.C. Tool Div., 101 W. Monre St., Chicago, IV. Mall Tool Co., 7742 S. Chicago Ave., Chicago M. B. Products, Detroit, Mich. Walker-Turner Co., Inc., Plainfield, N. J.

Grinders, Pedestal Electric Baldor Electric Co., St. Louin, Mo. Standard Electrical Tool Co., Cincinnati, O. Vallay Electric Corp., St. Louin, Mo.

Grinders, Swing Frame Vennegut Moulder Corp., Indianapolis, Ind.

Grinders, Tool Post Standard Electrical Tool Co., Cincinnati, O. Grinders and Polishers, Belt Oliver Machinery Co., Grand Rapide, Mich.

Grinders, Vertical, Angle Plate Standard Electrical Tool Co., Cincinnati, O.

Grinding Attachments, Drill Carlson Mtg. Co., C. H., Minneapells, Minn. Oliver Instrument Co., Adrian, Mich.

Grinding Compound
Timesaver Products Co., 31 8 Desplaines

Grinding Machines, Belt Allwaukee, Win. Production Machine Co., Greenfield, Mass. Standard Electrical Tool Co., Clincinnatt, O., Walls Sajes Corp., 95 Warren St., New York

Grinding Machines, Cutter, Reamer and Tool Gallmeyer & Livingston Co., Grand Rapido, Mich. National Machine Tool Co., Hacine, Wis. Oliver Instrument Co., Adrian, Mich.

Grinding Machines, External Chicago Tool & Engr. Co., 8380 So. Chicago Ave., Chicago, Ill. Standard Electrical Tool Co., Chicanatt, O.

Grinding Machines, Floor Standard Electrical Tool Co., Cincinnati, O.

Grinding Machines, Internal National Machine Tool Co., Racine, Wis. Standard Electrical Tool Co., Checknost, O.

Grinding Machines, Ring Wheel Standard Elect. Tool Co., Cincinnati, Ohio

Grinding Machines, Surface Gallmeyer & Livingston Co., Grand Rapida, Mich. Standard Electrical Tool Co., Cincinnati,

Grinding Machines, Tap Gallmeyer & Livingston Co., Grand Rapids, Mich.

Grinding Machines, Tool
Hammond Machinery Builders, Kalamasoo,
Mitch
Grinding Machines, Universal
Gallmeyer & Livingston Co., Grand
Mich.

Grinding Wheels
Chicago Wheel & Mfg. Co., M.C. Tool Div.,
1101 W. Monroe St., Chicago, Iti.

Grinding Wheels, Mounted

Chicago Wheel & Mig. Co., M. C. Tool Div., 1101 W. Mooroe St., Chicago, Ill. Grinding Wheels On Shanks Chicago Wheel & Mig. Co., M. C. Tool Div., 1101 W. Monroe St., Chicago, Ill.

Hack Saw Blades
Armstrong-Blum Mfg. Co., 841 N. Francisco

120

Hack Saw Machines Armstrong-Blum Mfg. Co., 341 N. Francisco Av., Chicago

Hammers, Electric Syntron Company, Fittsburgh, Pa.

Hammers, Mallets and Malls Chicago stawhids Mfg. Co., 1200 Elston Av., Chicago, Ili.

Hand Saws, Portable Electric Skilnaw, Inc., 3304 Elston Av., Chicago, Ill. Syntron Company, Pittsburgh, Pa.

Hand Screw Machines, Precision Beach Type

Hardinge Brothers, Inc., Elmira, N. Y.

Hangers, Ball, Roller and Babbitt Chicago Die Cauting Mfg Co., 2502 W. Monroe St., Chicago

Heads, Boring Plynn Manufacturing Co., Detroit, Mich.

Hole Cutters

Wysenbeek & Staff, Inc., 642 Weshington
Blind., Chicago

Hollow Adjustable Mills

Gairing Fool Co., Detroit, Mich. Kutmore Tool Co., Rochester, N. Y.

Hydraulic Valves Galland-Henning Mfg. Co., Milwaukee, Wis.

Index Centers Wm. Carroll & Son, Norwood, Cincinnati, O.

Indicators, Surface Test Retch Mfg Co., J R , Dayton, Ohio

Isometric Lined Paper Wade Instrument Co., Cleveland, Ohio

Jigs and Fixtures
American Fool Works, Inc., Hartford, Conn.
Hamilton Tool Company, Namilton, Ohio
Hartford, Special Mely Co., Hartford, Come

Keyseating Machines
Burr & Son, John T., Brooklyn, N. Y.

Knuris and Holders, for Turrets Graham Manufacturing Co., Providence, R.L.

Lapping Compound
Timesaver Products Co., 31 S. Desplaines
St., Chicago

Lathe Centers
Rigid Tool Holder Co., Detroit, Mich.
Sturdimatic Tool Co., Detroit, Mich.

Lathe Drives
Culiman Wheel Co., 1859 Altgeld St., Chgo,
Hardinge Brothers, Inc., Elmira, N. V.
Steege Machinery Co., W. L., 18 S. Cinton
St., Chicago

Lathe, Turret Heads Tom's Machine Co., Niagara Falls, N. Y.

Lather, Beach
Attas Fress to., Kalamassoo, Mich.
Delta Mig. Co., Milwauhec, Wis.
Hardings Hrothers, Inc., Empira, N. Y.
Hivetti athe& Grinder Inc., Hrighton, Hesten
Shelton Machine Co., 22-4, Chicago, Ill.
Sloan & Chare Mig. Co., Kezny, N. J.
South Head Lathe Warks, South Bend, Ind.

Lathes, Back Geared Rivett Lathe & Grinder, Inc., Brighton, Boston South Bend Lathe Works, South Bend, Ind. Lathes, Brake Drum South Send Lathe Works, South Bend, Ind.

Lathes, Engine Sebastian Lathe Co., Cincinnati, Ohio South Hend Lathe Works, South Bend, Ind.

Lathes, Gap Head South Bend Lathe Works, South Bend, Ind.

Lathes, Manufacturing Sundstrand Machine Tool Co., Rockford, III.

Lathes, Polishing and Buffing Hammond Machinery Builders, Kalamason,

Hammond Mactionery Builders, Kalamanoe, Mich. Lathes, Precision Beach Hardis go Brothers, Inc., Elmira, N. Y. Slong & Chace Mfg. Co., Kearny, N. J.

Lathes, Precision Bench Screw Cutting

Hardings Brothers, Inc., Elmira, N. Y. Lathe Service Parts

Milhotland Sales Co., Indianapolis, Ind.

Lathes, Screw Cutting South Hend Lathe Works, South Bend, Ind. Lathes, Speed Schauer Machine Co., Cincinnati, Obio

Leader Pins, Steel
Aeme Industrial Co., 419 N. Carpenter St.,
Chicago, Hi.

Chicago Rawhide Mig Co., 1200 Einton Av., Chicago Rawhide Mig Co., 1200 Einton Av.,

Chicago, III.

Leather Oil Retainers
Chicago Rawhide Mig. Co., 1200 Eleton Av.

Gits Bros. Mfg. Co., 1860 S, Kilbourn, Chge, Leather Pkg., Hydraulic & Pneumatic Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ili.

Lined Sketch Paper
Wade Instrument Co., Cleveland, Ohio

Live Lathe Centers Sturdimatic Tool Co., Detroit, Mich.

Lubricator, Automatic Gits Bros. Mfg Co., 1889 S. Kilbours, Chgo. M. B. Freducts Co., Detroit, Mich. Norgron Co., C. A., Denver, Colo.

Mandrels, Saw and Grinding Chicago Die Casting Mig. Co., 2502 W. Monroe St., Chicago.

Mandrels, Expanding
W. H. Nicholson & Co., Wilkes-Barre, Pa.
Western Tool & Mfg. Co., Springfield, O.

Micrometers Swedish Gage Co. of Amer., Detroit, Mich.

Milling Attachments
Burke Machine Tool Co., Conneaut, Ohio
Wm. Carroll & Son, Norwood, Cincinnati, O.

Milling Machines, Bench Register Machine Tool Co., Comwaut, Ohlo Hardinge Rrothers, Inc., Elmira, N. Y. Sloan & Chace Mfg. Co., Kearny, N. J. Sundstrand Machine Tool Co., Reckford, III.

Milling Machines, Precision Beach Hardings Brothers, Inc., Elmira, N. Y. Sloan & Chace Mfg. Co., Kearny, N. J.

Milling Machines, Hand Burke Machine Tool Co., Conneaut, Ohio Sundstrand Machine Tool Co., Rockferd, 111.

Milling Machines, Plain Burke Machine Tool Co., Conneaut, Obto Sundstrand Machine Tool Co., Rockford, III.

Meters
Chicago Electric Co., 1338 W. 22nd St.
Chicago Electric Co., 1338 W. 22nd St.
Meters, Small Universal
Speedway Mfg. Co., Cicaro, Ill.

Motor-Generator Sets Chicago Electric Co., 1338 W. 22nd St., Chicago, Ill.

Motor Drives, Universal Cullman Wheel Co., 1359 Altgeld St., Chgo. Steege Machinery Co., W. L., 18 S. Clinton St., Chicago

Motors, Electric Ball Bearing Valler Ricetric Corp., St. Louis, Mo. Moulds & Ladles, Hammer and Vise. Johnston Tool Co., Rast Providence, R. I.

Multiple Oilers Gits Bros. Mfg. Co., 1880 S. Kilbourn, Chgo

Nibbling Machines Libert Machine Co., Green Hay, Wis., National Machine Tool Co., Racine, Wis.

Oil Cups Gita Bros. Mfg. Co., 1860 S. Kilbours, Chgo. Tucker, W. W. & C. F., Hartford, Conn.

Oil Gauges Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo. Oil and Grease Scals

Gits Bros Mig. Co., 1880 S. Kilbourn, Chgo.
Oil Hole Covers
Tu.ker, W. W. & C. F., Hartford, Conn.

Operating Valves
Galland-Henning Mfg. Co., Milwaukee, Wis.

Packing, Hydraulic Chicago Rawhide Mfg, Co., 1200 Elston Av., Chicago, Ili.

Perspective Lined Paper Wade Instrument Co., Cleveland, Ohio

Pillow Blocks
Chicago Die Canting Mfg. Co., 2502 W.
Monroe St., Chicago
Pins and Lacing for Belting
Chicago Hawhide Mfg. Co., 1200 Eleton Av...

Pins, Leader And Dowel
Acmo Industrial Co., 419 N. Carponter St.,
Chicago, Ili.
Baumbach Mfg. Co., E. A., 1812 So. Ellbourse Ave., Chicago

Pipe Cutters Ridge Tool Co., Elyria, Ohio

Pipe Vises Ridge Tool Co., Elyria, Ohto Pipe Wrenches Ridge Tool Co., Elyria, Ohio

Plug Gauges United Precision Products Co., 4618 W. Huron St., Chicago, Ill. Point Thinning Machines Oliver Instrument Co., Adrian, Mich.

Presses
Allsteel Press Co., 12015 S. Peerla St.,
Chicago

Press Brakes
Allateel Frans Co., 12015 S. Peorla St.,
Chicago
Dreis & Krump Mfg. Co., 7440 Leomis
Blvd., Chicago, Ill.

Presses, Arber
Atian Press Co., Kalamanoo, Mich.
W. H. Nicholson & Co., Wilkes-Barre, Pa.
Sheidon Machine Co., 3255 Cattage Greve
Ave., Chicago, III,
Wilson, K. R., Buffale, N. Y.

Presses, Power
Allated Press Co., 12015 S. Peeria St.,
Chicago
Dreis & Krump Mfg. Co., 7449 Loomis
Blvd., Chicago, Ili.

Presses, Punch
Dreis & Krump Mfg. Co., 7440 Loomia
Blud., Chicago, Ili.
Henry & Wright Mfg. Co., Hartford, Comn.
Lewthwalts Mcho. Co., T. H., S11E, 47th., N. Y.

Presses, Steel
Allsteel Press Co., 12015 S. Peeria St.,
Chicago

Pullers, Gear and Wheel Armstrong-Bray & Co., 315 N. Shelden St., Chicago, Ill.

Pulleys, Die Cast
Chicago Die Casting Mfg Co., 2502 W.
Monroe St., Chicage.
Pulleys, Steel and Wood
Delt. Mfg. Co., Milwantee, Wie.

Pulleys, Vacuum Cup Vacuum Cup Metal Pulley Co., Detroit

Pumps
Fulfie Specialties Co., Blanchester, Ohie
Galland-Henning Mfg. Co., Milwaukee, Wis.

Pumps. Lubricant Ruthman Machinery Co., Cincinnati, Ohio

Punch Press Feeds Littell Machine Co., F. J., 4125 Ravenswood Wittek Mfg. Co., 4809 W. 24th Place, Chico.

Punch, Shear and Bender, Hand Armstrong Blum Mfg. Co., 841 N. Francisco Ava., Chicago

Punches, Hand Arastrong-Bium Mfg. Co., 341 N. Francisco Buffalo Forge Company, Buffalo, N. Y. Lawthwalte Miche. Co., T. H., 311 K. 47th, New York Whitney Metal Tool Co., Bockford, III.

Punches and Dies Lewthwaite Mcho.Co., T.H., 231E, 67th., N. Y.

Pusher Tubes Modern Collet & Machine Co., Ecorse, Mich.

Pyrometers
Illinois Testing Laboratories, Inc., 180 W.
Austin Ave., Chicage
Pyrometer InstrumentCo., 102-105 I afayette
8t., New York City

Pyrometers, Optical
Pyrometer Instrument Co., 102-105 Lafayette
St., New York City

Pyrometers, Portable & Stationary Illinois Testing Laboratories, Inc., 150 W. Austin Ave., Chicago, Ill.

Pyrometers, Surface Pyrometer InstrumentCo., 102-106 Lafayette St., New York City

Racks, Cut Manaschusetts Gear & Tool Co., Weburn, Mans.

Reamer Holders W. H. Nicholson & Co., Wilkon-Barro, Pa.

Reamers, Screw Machine Machinist's Tool Grinding Co., 4038 Van Buren St., Chicago

Regrinding, Tool Renu Tool Co., Detroit, Mich.

Riveters, Multiple Spindle Grant Mfg. & Mcho. Co., Bridgeport, Cons.

Riveters, Pneumatic Grant Mfg. & Mche. Co., Bridgeport, Conn.

Riveting Machines
Grant Mfg. & Mcha. Co., Bridgeport, Conn.
Linley Bros. Co., Hridgeport, Conn.

Red Cutters Armstrong-Blum Mfg. Co., 841 N. Francisco Av., Chicago Lewthwalte Mche. Co., T. H., 811 E. 67th. N. Y. Tucker, W. W. & G. F., Hartford, Conn.

Rotary Tools
American Rotary Tools Co., 5 State St.,
New York, N. Y.

Router Bits Putnam Teel Co., Detroit, Mich. Weldon Tool Co., Cleveland, Ohio

Salvage Vinco Tool Co., Detroit, Mich.

Sanders Retor Air Tool Co., Cleveland, Ohio

Saws, Electric Hand Delta Mig. Co., Milwaukee, Wis, Syntron Co., Pittsburgh, Pa.

Saw Sharpening Machines Wardwell Manufacturing Co., Claveland, O.

Sawing Machines
Continental Meho. Specialties, Minneapolis

Scraping Mcha., Hand & Pasumatic Anderson Bros. Mfg. Co., Rockford, Ill.

Screw Drivers, Electric Hankins Co., R. G., 4654 W. Fulton, Chgo. Screw Machine Parts Modern Collet & Machine Co., Ecorse, Mich

Screws, Transfer Heimann Mfg. Co., Urbana, Obio

Shafts, Flexible

R. G. Hankins Co., 4654 W. Fulton, Chicage
Frant & Whitney Co., Hartford, Conn.
Strand Co., N. A., 5601 N. Lincoln St., Chage.
White Dental Mfg. Co., 10 E. 40th Street.
New York, N. T.

Shafts, Hangers & Boxes Delta Mfg. Co., Milwaukee, Win-

Shafts, Steel American Hollow Boring Co., Erie, Pa.

Shapers Western Mche, Tool Wks., Holland, Mich.

Shaping Machines Osborne & Sexton Machy. Co., Columbus, O., Western Mche, Tool Wks., Holland, Mich.

Shears, Hand
Armstrong Blum Mfg. Co. 841 N. Francisco
Beverir Throatiese Shear C. A. Chicago
Beverir Throatiese Shear C. A. Chicago, III.
Lewthwalts Machina Co. T. H., 311 E. Article
The National Machine Tool Co. Racine, Wis.
Whitney Metal Tool Co. Rockford, III.

Shears, Power
Drein & Krump Mfg. Co., 7440 Loomis
Bivd., t hicage, III,
Libert Machine Co., Green Suy, Wis.

Shears, Shitting
Beverly Throatless Shear Co., 3007 W.,
110th Place, Chicago, III.
Dreis & Krump Mfg Co., 7440 Loomis
Bird., Chicago, III.
National Machine Tool Co., Raches, Wis.

Shears, Threatless Beverly Threatless Shear Co., 2007 W. 110th Place, Chicago, M.

Sheet Metal Machinery Libert Machine Co., Green Bay, Wie.

Shop Lights
Chicago Die Casting Mfg. Co., 2502 W.
Monroe St., Chicago,

Special Tools and Machinery American Tool Works, Inc., Hartford, Conn. Tagiln, Joseph J., 215 N. Despisions St., Chrisgo, Ill.

Speed Reducers
Abart Gear & Mohe. Co., 4882 W. 16th St.,
Cicero, Ill,

Armglo Co., Milwaukes, Win.
Chicago Gear Win., 769 W. Jackson, Chgo.
Cullman Wheel Co., 1359 Alfgeld St., Chgo.
Multiple Boring Machine Co., St. Louis, Mo.

Speed Saws, Universal
Wyzenbook & Staff, Inc., 642 Washington
Hivd., Chicago

Spinning Lathes, Metal Oliver Mechinery Co., Grand Rapids, Mich.

Speels & Nuts for Auto. Screw Mchs. Sutton Fool Co., Detroit, Mich.

Spot Welding Machines, Speed. Armsto Co., Milwaukee, Win Bislet Engineering Co., Inc., Newark, N. J. Pler Equipt. Mfg. Co., Beston Harbor, Mich.

Sprockets
Cutiman Wheel Co., 1359 Altgeld St., Chgo.
Massachusetts Gear & Toel Co., Woburn,
Massachusetts Gear & Toel Co., Woburn,

Stampings Gerding Brothers, Cincinnati, Ohio Wrought Washer Co., Milwaukse, Wis,

Steel Lockers Narraganaett Mche. Co., Pawtucket, R. I.

Steel Shelving Narragansett Mche. Co., Pawtucket R. L.

Straightening Machines
Whitney Motal Tool Co., Rockford, III.
Tables, Elevating

Midwest Tool & Engineering Co., Dayton.O.

Tap Extractors Walton Co., Hartford, Conn.

Tap Helders
Precunier Safety Chuck Co., 14 S. Clinton
Mt., Chicago
Tapping Machines
Etter Ion Co., Brooklyn, N. Y.
Rickert Shefer Co., Eric. Pa.,
Sloan & Chace Co., Kearny, N. J.
Western Mche. Tool Was, Holland, Mich.

Tapping Attachments
Errington Mech. Lab., Staten Inland, N. Y.
Ettec Tool Un., Brooklyn, N. Y.
Procunier Safety Chuck Un., 14 S. Clinton
St., Chicago. Ili.
Western Miche. Tool Who., Holland, Mich.

Tapping Jigs, Universal Houser Mfg. Co., 1638 No. Paulina St., Chicago, Ili.

Tapping Machines and Attachments Burks Machine Tool Co., Conneaut, Ohio Gleoreman Miche. Teel Co., Green Hay, Wis. Etter Fool Co., 599 Jonnon Av., Broellyn, Haskins Inc., R. G., 4654 W. Fulton St. Precunier Safety Chuck Co., 12 Whitney Metal Tool Co., Reckford, III.

Thermometers, Resistance Type Blinois Testing Laboratories, Inc., 150 West Austin Ave., Chicago, Iii.

Threading Machines, Automatic Grant Mfg. & Mche. Co. Bridgeport, Comp. Bickert-Shafer Co., Erle, Pa.

Threading Tools
Armstrong Bres. Teel Co., 808 N. Francisco
Av., Chleage
Bidge Tool Co., Elyria, Ohio.
Elyett Lathe & Grinderine, Brighton, Boston

Tool Holders
Armstrong Bros. Tool Co., 808 N. Francisco
Av., Chicago

O. K. Tool Co., Shelton, Conn., Sigid Toolbolder Co., Detreit. Mich. Western Tool & Mfg. Co., Springfield, O.

Tools Vinco Tool Co., Detreit, Mich.

Tools, Abrasive White Dentai Mfg. Co., 10 E. 40th Street, New York, N. Y.

Tools, Bering
Armstrong Bres. Tool Co., 1998 N. Francisco
Gairing Tool Co., Detroit, Mich., Chleage
O, K. Tool Co., Shelton, Coon.

Tool Grinding Renu Tool Co., Detroit, Mich.

Tool Salvage Renu Tool Go., Detroit, Mich.

Tools, Lathe and Planer
Armstrong Bros. Tool Co., 308 M. Francisco
Av., Chicago

O. K. Tool Co., Sheiton, Conn.

Tools, Machinists'
Armstrong Bres. Tool Co., 308 N. Francisco
Av., Chitago

Tools, Multi-Diameter Gairing Tool Co , Detroit, Mich.

Tracing Sheets Wade Instrument Co., Cleveland, Ohio

Transfer Punches McMahon Co., Frank, Dayton, Ohto

Transfer Screws
Betmann Mig. Co., Urbana, Ohio
Tube Flanging Machines
Grant Mig. & Mcho. Co., Bridgeport, Cons.

Turning Tools
R & L Tools, Nicetown, Phile., Pa.

Turret Lathes Milihosland Sales Co., Indianapolis, Ind.

Turret Lathes, Tools Miliboiland Sales Co., Indianapolis, Ind.

Universal Drill Jigs Heuser Mfg. Co., 1638 No. Paulina St., Chicago, Ili,

Universal Joints American Tool Works, Inc., Hartford, Coon. Chicago Gear Works, 769 W. Jackson Hivd., Chicago

Used and Rebuilt Machinery
Adams Mchr. Co., 134 S Clinton St., Chp.
Atamo Engine Co., Hillidade, Mich.
Beal & C., Jos., Sucton. Maan.
Bell & C., Jos., Sucton. Maan.
Bell & C., Jos., Sucton. Maan.
Bellya Co., Inn., 150 W. 18th St., New York,
Bennet RafkinCorp., 30 Church St., N. N. York,
Bennet RafkinCorp., 30 Church St., N. N. N.
Bernatein & Co., Leon. M., 128: Clinton, O., Nye,
Hasser Mig. & Mchv. Co. Springfield Ill.
Freadley Machinery Co., Petrol, Mich.
Brownell Machinery Co., Providence, R. I.
Clinton Mchy. Co., 33 S. Clinton St., Chine
Park Co., 13 S. Clinton St., Charles, Ind.
Pavis Machinery Co., Todden, Chip.

Used and Rebuilt Machinery -- Cont. Denny, W. I., 618 W. Lake St., Chicago, Esstera Machinery Go., Cincionati, O., Esstera Machinery Go., Newark, N. Y., Emerman, Louis E. & Co., 1781 Einten Englisher Englisher Repair, Inc., Huffsio, Physics Electric Motor Repair, Inc., Huffsio, Ensley Machinery Co., E. L., 825 Rees St Chicago, Ill. Falk Mill Supply Co., Rochester, N. Y.
Ford City Machinery Sales Co., Ford City, General Blower Co., 401 N. Peoria St., Chgo. General Mactificery Corp., Beston, Mans. Goldshar, Marvey H., Detroit, Mich. Goldshar Machinery Co., 817 W. Lake St., Hill, Clarke & Co., 645 W. Washington Biv Chicago, III. Howarth Mchy. Co., Inc., C. C., Detr Mich. Hyman & Sons, Joseph, Philadelphia, Pa. Indianapolis Machinery & Supply Company, Indianapolis, Ind. Indianapone, Indianapone, Indianapone, Inc.
International Machinery Co., Detroit
Internate Michy Co., 130 S Clinton, Chgo.
Iroquels Machinery Co., Huffalo, N. Y.
Johnson & Sons Machinery Co., Wm. C.,
St. Louis, Me. Jones Machine Tool Co., Cincinnati, Ohio Kiney Lu, E. A., Cincinnati, Ohio Kiney Lu, E. A., Cincinnati, Ohio Kiney Lu, E. A., Cincinnati, Ohio Lucae, J. I., Eridesport, Can. M. Louis McCionals Machinery Co., M. Louis McCionals Machinery Co., M. Louis Course, J. Church M. New York, N. McCionals Machinery Co., A. R. Cieveland, O. McCarett Machinery Co., A. R. Cieveland, O. Midreat Squipment Ch., So. Chicago, H. Midreat Squipment Ch., So. Chicago, H. Midwest Equipment Co., 628 W. Lake St., Chicago, III, Miles Machinery Co., Saginaw, W. S., Mich. Molitor Machinery Co., Charles L., 120 S. Morey & Co., 45 Mill St., Astoria, Longo, III. Machinery Co., Newspialand, N. Y. Morris Machinery Co., Newark, N. Morris & Sons Co., 1026 W. 50th St Cheo Morris & Sons Co., 1026 W. 50th St., Chgo. Norton-Broadway Machinery Co., Cincinnet O'Brien Machinery Co., Philadelphia Ott Machinery Sales Co., Detroit, Mich. Oshorne & Sexton Machy, Co., Columbus, O., Rellance Machinery Sales Co., Pittsburgh, Reynolds Machinery, Providence, R. I.,
Riverside Machinery Depot, Detroit, Mich.
Rosenkrans & Weisbecker, 2009 A Singer
Russell Machine Co., Pittsburgh, Fa.
Scott-Bansbach Mchr. Co., 4807 W. 20th St.,
Chicare Chicago Scully Jones & Co., 1901 S. Rockwell S Segal Machinery Co., 117 S. Chicago, Ill. Chicago, III. Chicago, III.
Simmons Machine Tool Corp., Albany, N.Y.
Standard Meby, Co., Grand Rapids, Mich.
Stockman, John A., Honestiale, Pa.
Strafer Machinery Co., 136 Liberty St.,
Strong, Carlinle& Hammond Co., Gleveland, Strong, Carllele& Hammond Co., views. Sun Machinery Co., 28 Van Buren Street, Newark, N. J. United Mchry. & Supply Co., St., Lous, Mo Victor Machinery Co., 128 S. Clinton Street Victor Machinery Exchange 251 Centre New York, N. Vine, R. A., Detroit, Mich. Wain Mchy, Sales, Chas. E., Detroit, Mich, Wartman Machinery Co., Cleveland Ohio West Penn Machinery Co., Pittsburgh, Ps., White Machy, Co., A. D., 168 N., Jefferson White macny. St. Lineage. Wigglesworth Mchy. Co., Cambridge, Mana. Woinick Machinery Sales, 9 S. Clinton St., Chicago, III,

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A

Vacuum Cleaners, Portable Brouer Elec. Co., 846 Blackhawk St., Chgo. Vacuum Cleaners, Industrial Breuer Elect. Co., 846 Blackhawk St., Chgo,

Valves Galland-Henning Mfg. Co., Milwankee, Wis.

Valves, Foot, Lever & Solenoid Nicholson & Co., W. H., Wilken-Barre, Pa.

Vises, Drilling Machine Vises, Drilling Machine
Armstrong Blum Mfg. Co., 341 N. Francisco
Av., Chicago Armstrong Bres, Tool Co., 308 N. Francisco Av., Chicago Graham Manufacturing Co ,Providence, R. I. Heuser Mfg. Co., 1638 No. Paulina St., Chicago, Ili. L-W Chuck Co., Toledo, Ohio Martin Iool & Die Works, J. E., Springfield, O, National Machine Tool Co., Racine, Wis. Odin Universal Corp., 110 S Dearborn, Cheo, Sheldon Machine Co., 3255 Cettage Grove Ave., Chicago, III. Walker-Turner Co., Inc., Plainfield, N. J.

Vises, Drill Johnson Tool Co., East Providence, R. L.

Vises, Machinists'

Vises, Machinists
Chicago Tool & Engr. Co., 8380 So Chicago Co & Chicago, Ill.
L-W Chuck Co., Toledo, Ohio
Odin Universal Corp., 110 S. Dearborn, Chgo.
Bheldon Machine Co., 2836 Cottage Grove
Ave., Chicago, Ill.
Western Tool & Mfg. Co., Springfield, O.

Vises, Milling Machine Vises, Milling Ruchine Graham Manufacturing Co., Providence, B. I., Hartford Special Mehy, Co., Hartford, Conn. L. W. Chuck Co., Toledo, Ohlo Odlin Universal Corp., 110 S. Dearbern, Chgo. Odlin Universal Corp., 110 S. Dearbern, Chgo. Sheidon Machine Co., 3255 Cottage Green Sheidon Machine Co., 3255 Cottage Green

Vises, Precision Odin Universal Corp., 110 S. Deerborn, Chro.

Vises, Shaper Graham Manufacturing Co., Providence, R.I., I. W. Chuck Co., Toledo, Ohlo Odin Universal Corp., 110 S. Dearbora, Chgo.

Wrought Washer Co., Milwaukee, Wis,

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Wheel Pullers Armstrong-Bray & Co., 316 N. Sheldon St Chicago, Ill.

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Woodworking Machinery Tannewitz Works, Grand Rapids, Mich. Worm Gear Motor Units Star Mche. & Eng. Co., Bloomfield, N. J.

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Used and Rebuilt Machinery Section

Lists of Used and Rebuilt Machinery, either For Sale, Wanted, or For Exchange, set in uniform style, will be published in the Classified Section at the rate of 80 cents a line across the page, each issue, plus \$3.00 for name and address. Minimum charge, \$6.00. No display permitted.

Write directly to those offering the machines for sale, for prices and full descriptions. If what you seek is not advertised, use the enclosed printed form to make known your wants in either new or used machinery and the publisher will gladly pass them along to the advertisers.

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Falk Mill Supply Co., Inc. No. 18 Ward St., Rochester, N. Y. Bulldozer, No. 22 Williams & White, motor drive. Coining press, 900 ton Ferracute, 30° bet, uprights, 3" stroke. Squaring shear, Toledo No. 500#H; 16'x\frac{1}{2}" cap., gap, hold down.

FOR SALE BY

| I. F. Wolnick Machinery Co., . | - 9 So. Clinton St., Chicago, Ill |
|------------------------------------|--------------------------------------|
| Band saw, Klemm metal. | Planer, 72"x54"x18" Niles. |
| Bench lathe, Daiton, legs and pan. | Saw sharpener, auto., Cochrane-Bly |
| foring mills, 36"-84", vertical. | Shear, Ohl. 10', 16 ga. |
| ear hobber, No. 12 Barber C. | Shear, circular, Lenox, 14 ga. cap |
| lack saw, Marvel No. 5, power. | Spot welder, A. E. F. 15 k. w., auto |

FOR SALE BY

| L. Klauber Machinery Co., | 320-322 South Third St., St. Louis |
|--|---|
| Orills, H1-speed b. b. 7" overhang. Orill, 6 spindle, Taylor & Fenn. Orill, radial 24", motor head, Lathes, 14x8, 18x8, 20x12. Planer, 15"x15"x36" and 30"x30"x8'. | Rolling machine, Toledo, strip. Riveting machine, No. 2 Grant. Screw machines, hand 7/16" bar fd. |

FOR SALE BY

York m. d., table. table. rsburg.

| Strafer Machinery Co., | - 136 Liberty St., New |
|--|-------------------------------|
| Brake, 12'x\frac{1}{2}' Low & Nawrath. | Miller, 48"x48"x14' Bement, |
| Hammer, drom3000 lb, B. & S. modern, | 4 heads, modern heavy duty |
| Lathe, 48"x 32' Bridgeford geared bd., | Planer, Cin. 30"x20' 411 box |
| motor drive taper attach. | Planer, Cin. 30"x14' 2H box t |
| Lathe, 36"x 16' Monarch G. H.M.D. | Wheel press.400 ton Chamber |

| | | OR | SA | LE BY | r | | |
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| General Blower Co., | | | | 401 | N. | Peoria St | , Chicago, Ili. |
| | | | | -EXH | AU | STERS. | |
| For Dust Collecting - V | entila | tting | | | | | |
| Oil and gas burners, cup- | las, f | urna | ces. | etc. | | | |

Roots-Connersville and centrifugal blowers.

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| Drill, Minster, 2" cap\$650.] | Shear, rotary, 60" thoat 50. | | | | | |
| Drill, mult., No. 13 P. & W 150. | Turret lathe, No. 3 Foster 100. | | | | | |
| Grinder, 65 Heald cylinder 100. | Turret lathe, No. 5 Foster 100. Wood jointer, 16" 85, | | | | | |
| Grinder, No. 11 B. & S. plain. 225, | Wood jointer, 12" 50. | | | | | |

FOR SALE BY

Brownell Machinery Co.,

Boring mill, 54" Bertram vertical. American univ. radial. Grinder, No. 55 Heald cylinder. Lathe, 80"x30' Pond.

150 Pine St., Providence, R. I.

Lathe, 32"x28' New Haven. Miller, No. 3 Hendey universal. Planer, 24"x24"x6' Whitcomb. Shaper, 20" Gould & Eberhardt.

FOR SALE BY

Standard Machinery, 321 Lake Michigan Dr., Grand Rapids, Mich.

Automatic, I' Gridley Model G. Automatic, II' Gridley Model F. Automatic No. 00 B. & S. Drill, Allen 2 spindle b. b. Drill, Baker 3" heavy duty.

Drill, Natco Model 5D multiple. Lathe, No. 2 B. & O. turret (1"). Press, D-23 Ferracute inclinable. Press, No. 18 Bliss inclinable. Welder, No. 259A12 T. Gibb. 60-440 v.

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Grinder, No. 2 Wdmarth & M. surf. Grinder, No. 6 Besley, opposing type, disc. Hammer, 100 lb, Bradley upright

Lathe, 15"x8' Sidney, q. c. g. Lathe, 28"x18' Pittsburgh, q. c. g. Lathe, 16"x8' Hendey, q. c. g., t.&col. Lathe, 18"x8' Walcott, q. c. g.

Press, No. 53 Toledo, SS. Sander, 15" Peerless vert, belt. Screw driver, No. 1 Reynolds Screwmachine, Cleve.model Baut, Shaper, 15" & 24" Potter & J., crk, Square shears, 48"x10 ga. Bertsch. Shear, 205 P.S. & W. circle & tlanging. Threaders, & geometric, sgly.double heads.

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Grinder, No. 12 Bryant, motor drive, late type Grinders, Nos. 12 & 15 Teromatic int.

Grinders, Nos. 70 & 75 Heald inter. Grinder, No. 2 Brown & S. surface. Gas truck, Clark Hi-lift. Lathe, No. 8 Rivett precision bench.

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Tapper, 16-spindle Fox, motor dr.

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Shear, sq. 16'x4' Niagara. m.d.
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Straitener, 54" United 17 rolls 3"dia.
Straitener, 54" United 17 rolls 3"dia. Straitener, 60" McKay, 17-rolls 4"dia. Straitener, angle, Newbold, 478, 478, 478, Straitener, angle, Newbold, 478, 478, Straightener, 1½7, 47 rd. Abramson, Table, rotary, 247; raduated 360 deg. Tapping machine vertical 47 Baker. Upsetters, 17 to 67. Welder, 40 kw. Thom. 2 pcs. ?". Welder, spot, 100" k.w. Federal.

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24" Cincinnati duplex, m. d. of table, m. d. 4"Pratt & Whitney spline. Garvin cam and form, 36" capacity.

Garvin cam and form, 36" capacity.

PUNCH PRESSES AND SHEARS

PUNCH PRESSES AND SHEARS

No. 734 Bliss punch press, 3" stroke. 3A Bliss horning press, 1" stroke. 36 Niagara m. d., flyweeel in back. No. 196 Niagara squaring, 18 gauge 10'x3/16 capacity Streine squaring, shear, 18" gap, m. d. capacity.

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25-AC Lees-Bradner gr. generators, 1-A Warner&Swasey bar equipment. motor drive. 16" G. & E. shapers, motor or ., (3).

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Wm. C. Johnson & Sons Machinery Co.,

1211-1223 Hadley Street. Air compressors, 30' to 2000 Bolt threader Little Grant 14". Bolt threader, Nat. 2 Bolt threader, 2 heads, Nat. 1". Boring mill, 5' 8' Betts extension. Boring mill, 42" Colburn, (2). Boring mill, No. 0 Barret. Boring mill, 38" Gisholt tur. head.

Boring mill,, hor, 4# bar Betts knee type.
Bulldozers, No. 3-4 and 8.
Drill, radial 3' American.
Drill, radial 3' Gang. Drills, Tadial, 4' arm, Dreses, b. d. Drills, Colburn D4. Drills, Baker 24". Furnaces, various sizes. Gear cutter, 60" G.E. spur, Grinder, 12"x72" Landis, m. d. Grinders, 10x36 Thompson uni. Grinders, 13x66 Landis universal. Grinders, 16x66 Landis cyl plain. Grinders, surface Springfield 24x60" Hammers, 500 & 25 lb. Little Giant, Hammer, 200 lb. Bradley. Hammer, steam 4000 to 250 lb. Keyseater, No. 2 M&M. Lathes, 14"x6 American gear head. Lathes, 14"x6 Hendey. Lathe, 18"x8' geared head American. Lathe, 18"x8' L. & S. Lathes, 20"x8 Walcott, q. c. g. Lathes, 26"x12 Flather, q. c. g.

St. Louis, Me. Lathes, 30"x24 Bradford, Lathes, turret, No. 0 Foster. Lathes, turret, 24" Steinle. Lathes, 3 Gridley 24", Model F., 4 sp. Miller, No. 4 Brown & S. plain. Miller, No. 3 Hendey, plain. Miller, No. 12 Rockford. Millers, No.4 Cincinatti pl., c. d. Millers, No. 1 U. S. hand Millers, Ingersoll, 27"x24"x10'. Millers, ingerson, 27 x29 xiv. Planer, 38 30xxCleveland open side, Planers, 80"x46"x10' Gray, 2 heads, Planers, 24"x24"x6' Gray, 1 head, Planers, 30"x30"x8' Cincinatti, 7 hds. Planers, 30"x36"x10' Gray, h. d. 2hds. Planers, 36"x36"x10' Cincinati. Press,91C Toledo Press, whl., 250 ton 54"Tomlin-Harris Press, No. 2-3 & 4 Marshalltown, o. b. i., new. O. D. I., new. Press, arch, d. c., 28x54 boister, No. 37 ex. Rolls, Niagara, 66'slip end, 5/16'cap. Saw. No. 14 Higley. Saw. No. 2 Marvel. Saws, 6x6 Robertson (2) Shaper, 16" Smith & Mills, Shear, 10' Niagara, 18 ga. Shear, 3' Niagara, 16 ga. Shears, 310 Niagara ring & circle 1/4" Shears, 44" Bertsch sq., 16 ga. Shears, No. 114 Lenox 1/4"

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threading attachment. Boring mill, floor, 6" bar N. B. P., 230 v. d. c., 2 column,

Brakes, hand, 4'x14 ga. Robinson Brakes, hand, 6'x16 ga. Keene. Brake lining, punch and riveting machine, m. d.

Bulldozer, No. 6 W-W., clutch, b.d. Bulldozer, No. 22, W.-W., m. d. Chain hoists, 1½, 2, 3 and 4-ton, Crusher, Allis-Chalmers, 9x9",2-roll, belt drive.

belt drive.

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Drill, 5, 6 spoil, L. G., b. b. m. d.

Drill, rad., 24" Foodick & Holloway.

Drill, radial, 34" Caredy Otto.

Drill, radial, 34" Caredy Otto.

Drill, radial, 34" Coress Simplex,

Grinder, Nos. 1, 14 & 2, tool & cut.

Grinder, Nos. 1, 14 & 2, tool & cut.

Grinder, ph. b. p. U. S. db. end, 3/60.

Grinder, ph. 1 & S. & \$4.20" (cheap).

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quick change geared. Lathes, 16"x7" National, q.e. g., (3). Lathe, Fox Monitor, 18"x6" Springfi. Lathe, 26"x16" Bridgeford, q.e. g. h. Lathe, turret, No. 2 B. & O., b. d. Lathe, turret, No. 4 W. & S., bar

feed, m. d. (2).
Lathe, 11" Sundstrand, g. h., s. p. d.
Lathe, 14"x19" Fay automatic.
Miller, hand, No. 1 U. S. (2). Miller, No. 4 Ohio table 101 Pipe machine, 12" Cox., b. d.

Pipe machine, 8" Stoever, gear box, s. p. d. Pipe machine, 4" B. & K., gear box.

motor drive. Pipe machine, 12" E. C. & B., with

cut-off. Pipe machine, 18" Wieland, m. d. Planer, Gray, 56x48x10', 4 heads. Planer, 30"x30"x8' Liberty, 2-h. m.d. Planer, 48"x48"x10' Gray, 3-hds., b.d. Planer, 72"x56"x20'Cin..3-hds..m.d.

Press, punch, No. 35 Niagara, plain, belt drive. Press, No.2 Con., o.b.i., 2" str., m.d. Press, S.C. 57, 573 & 58 Toledo, b.g. Press, S. C. 792 Bliss, t. r., d. b. g.,

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Rolls.42"x3"Pexto, latch hsgs., hand. Sandblasts, Pangborn AU-3 & AA-1. Sandblast, Leiman, size A-1. Saw, No. 1 Marvel hack, 4"x4", b.d. Saw, 6"x6" Racine hack, gear box, belt drive.

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Shear, throatless 18-M Marshalltown, motor drive. Shear, bar 3" United, 24" blade, m.d. Shear, slit'g, Buffalo 24-S (Armor pl.) Shear, plate, 16'x\frac{\pi}{2}'' L. & A. 20'' gap. Steam turbines, 100h. p. 900 rev. (2). Valve refacer, Kwik-Way, cabinet

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Grinders, Brown & S. No. 13, tool No. 2 B. & S., univ. & surface: Cincinnati No. 3 Univ. 12x48".

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J. & L. 2"xx4" & 3"x36"; Warner
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Milling med. R. & S. No. 14 mix

Milling mchs., B. & S. No. 13 univ. Cincinnatiplain No. 2 high power; LeBlond No.4 plain cone: Kempsmith Nos. 12 and 33Mfg.; Model

B Becker vertical, & No. 5 B. Planers, Cincinnati 60"x60" x20" 3-heads, m. d., Gray, 42"x36"x14" 3 heads

Presses. Ferracute P2, 3 and 4, and D G 53; Lucas 50 ton horizontal; Metalwood 30 ton hydraulic.

150 W. 18th St., New York, N. Y.

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| Della | r Com | pany, n | III. | 130 11. | 10th 2f" 14 | SA I OLK | 2 24. 2 |
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| D. C. MOTORS | | | 1 1-500 k. w. West. D. C. Gen. 250 | | | | |
| Adj. Speed -230 Volt | | | V., conn. to 710 h. p., 8 P. F. | | | | |
| H. | P. | TYPE | SPEED | sync | h. motor 4 | 600/2300 1 | 7 1290 |
| 1 - 150 | () | West. | 470/600 | F, D, | m . 3 phase | . 60 cycle. | |
| 1 - 25 | 0/410 (| Cr. Wh. | 1000 1200 | | c. w., Crock | | |
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| 2 - 12 | 5 | West. | 240 / 600 | D. (| conn. to | 30 h.p., So | . Cage. |
| 2 - 12 | 0 | G. E. | 300/ 750 | A. 1 | C. motor, | 2300/440 | V 720 |
| 3- 8 | | Diehl | 500/1100 | r. D. | m., 3 ph., 6 | 0 cv. | |
| 1- 7 | 5 | G. E. | 300/ 900 | 1 | A. C. MC | | |
| 2- 6 | 0 1 | El. Dy. | 450/1200 | 1 | Synch. | | |
| 5- 6 | 0 1 | El. Dy. | 525/1050 | H.P. | TYPE | VOLTH | SPEED |
| 2- 5 | 0 | West. | 225/ 600 | 1 - 2850 | G. E. | 2300/415 | 0 450 |
| 1- 4 | 0/50 4 | Cr. Wh. | 175/ 700 | 1- 675 | Al. Ch. | 2200/ 556 | 900 |
| 1- 4 | 0 | West. | 300/ 900 | 1- 600 | G. E. | 2200/ 556 | |
| 1- 4 |) | West. | 600/1200 | 1- 260 | Al. Ch. | 2200/ 440 | |
| 1- 3 | 5 (| Cr. Wh. | 800/1600 | 1- 125 | West. | 2300 | 900 |
| 12- 2 | 5 | West. | 650/2200 | 1- 50 | G. E. | 440/220 | 1200 |
| 2- 2 | 18 | West. | 375/1500 | 1 1- 25 | G. E. | 440/220 | 1200 |
| 1- 2 | 0 | West. | 550/1100 | | SLIP F | | |
| 2- 2 | 8 | G. E. | 500/1500 | 1-1200 | West. | 2200 | 360 |
| 20- 10 | 0 | West. | 500/1500 | 1- 600 | G. E. | 2300/550 | 257 |
| 25 - 79 | 1 | West. | 400/1600 | 1 1- 600 | G. E. | 2300/440 | 705 |
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| 6600 v., 360 r. p. m., 3 ph. 60 cy. | | | | JIRREL C | | | |
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| | | | conn. to 1400 | 1- 250 | West, | 2300/440 | 580 |
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| Air compressor. Daco No. 605P complete, motor and tank | 85. |
| Air compressor, Curtis model A, 42x44, 8 to 16 cu. ft., | 50. |
| Air comp., Curtis, Model A, vertical, duplex, 8"x8", cap. 80-110 cu. ft. Automatic screw machines, B. & S., Nos. 00, 0, 2 | 250. |
| Automatic turret former, B. & S., Nos. 0, and 2 | 100. |
| Automatic cut-off R & S No. 00 high serial | 400. |
| | 400. |
| Automatic screw machine, Gridley, 4 spindle model G. 9/16" cap | .003 |
| Automatic screw machine, Gridley 4 spdl, Model F . 4" and 24 \$150 & | 750. |
| | 600. |
| Automatic screw machine, Cleveland Model "M" 4 spindle, 1", m.d. 1 | 000. |
| | 300. |
| Dell Demon h. s. h. h. A" canacity | 100. |
| | 135. |
| Drill, Leland Gifford, h. s., b. b., 14" swing, No. 2 M. T. | 50. |
| Drill, 2 spindle Leland-Gifford h. s., b. b., 14", No. 2 M. T. Drill, 2 spindle H. & W. h. s., b. b., 16" swing, heavy duty, class B | 250. |
| Drill, 2 spindle H. & W. h. s., b. b., 16" swing, heavy duty, class B | 175. |
| Drill, 3 spindle Avey, h. s., b. b. bench type on pedestal, g" cap | 200. |
| Drill, 3 spindle, Avey, n. s., b. b., 14 swing, No. 2 M. T. | 300. |
| Drill 4 enjude Signumer plain by 14" swing No. 1 m. 4 | 500. 125. |
| | 100. |
| Drill, 4 spindle Demco, h. s., b, b., 16" swing \$" capacity | 100. |
| | 750. |
| Drill, 20" Canedy-Otto, back geared, power feed | 100. |
| | 35. |
| Drill 26" Superior sli. head., bg., pf. with tapping attach. m. d | 100. |
| | 110. |
| | 275. |
| | 50. |
| Filing machine, No. 3 Bary, floor type, belt drive | 00_ |
| Gear cutter, B. & S. No. 3, 26" for spur gears | 100. |
| | 00. |
| Grinder, surface, Kinney & Martin, hand type, belt drive | 00, |
| Grinder, surface, W. & M., cap., 8"x24" with magnetic chuck | 75. |
| | 100. |
| Grinder, Heald, No. 65, cylinder, 16" spindle and fixture. | 50. |
| Hammer, No. 3 A h. d., &" cap, with motor bracket. | 50. |
| | 100. |
| Hammer, No. 5A High Speed, motor shelf, capacity | 75. |
| Hammer, Bradley, 30 lb, compact belt drive | .00 |
| | 150. |
| | 50. |
| | 00. |
| | 50. |
| Lathe, 15"x6' Goddard, standard chuck, raised to 21", 2 chucks | 00. |
| Lathe, 15"x6' Springfield, q, c., b, g., taper attachment | 25. |
| | 50. |
| | 00. |
| | 00. |
| Lathe, 17"x8' Cincinnati, semi q. c., d. b. g., withchuck | 75. 50. |
| | 75. |
| Lathe, 19"x10' LeBlond, q. C., s. b. g., with 4 jaw chuck. | 50. |
| Lathe, 20"x8' Prentice, plain change with 2 chucks | 50. |
| Lathe, 24"x13' Dietz, Schumacher & Bove, plain change, with chuck. 3 | 00. |
| Lathe, 30"x13" H. S. & G. heavy duty, q. c., d. b. g. 16,000 lbs | 100. |

FOR SALE BY

Reliance Machinery Sales Company

1405 Brighton Place, N. S.

Brake, 72"x12 ga. Robinson, toggle. Brake, 72"Niagara, power, motor dr. Bulidozer, No. 9 W.-W., 70,000 ibs. Corrugating rolls, 60", belted. Drill, 4 spdl. 20" Barnes, all geared. Drill, 3 spindle, 26" Barnes, t. a. Drill & tap., No. 314 Baker, cap. 3". Drift & tap., No. 314 Baker, cap. 3°. Grinder, surface, No. 2 Wil. & M. Lathe, 48"x32" Pond, triple geared taper attachment. Lathe, 24"x12" B. & E., q. c. g., t, a. Lathes, spinning, No. 6 Bliss & 326

Toledo, roller bearing spindles.

Pittsburgh, Pa. Lathe, 48"x20' Betts Bridge, grd. hd. Millers, vert., 5B and 5C Becker, Planer, 36"x10" D. & H., openside, Press, dbl., crank, 10' wide, 7" shaft, Press, No. 2-W Bliss wiring.

Press, No. 3 C Bliss horning. Press, No. 3 C Bliss toggle. Punch & shear, L. & A. cap, 1 thru 1", with angle blades, etc.

Shaper, 36" G. & E. cone drive. Shear, 72"x16 ga., M. D. Welders, 200, 300, 400 amp. Lincoln, motor end 3-60-220-v. a. c.

FOR SALE BY

The O'Brien Machinery Co.,

Boring mill. 24" Bullard, rap. prod., threading attachment.
Boring mill, 31" bar Gidding &
Lewis horiz, table 23" x45".

Drill, 3' gang radial, belt drive. Drill, 6' Mueller radial, mtr. dr. Drill, 32"Cin. Bick.upright, s.p.drive. Grinder, No. 1 Wilmarth & Morman universal tool and cutter. Grinder, No. 55 Heald

Grinder, No. 55 Heald, Hammer, 100 lb. Bradley, helve, Hammer, 800 lb. Erie, steam forging, Hammer, 1100 lb. NBP, steam forg, Hammer, 2000 lb. Chambersburg double frame steam.

113 N. Third St., Philadelphia, Pa.

Lathe, 24"x10' Greaves Klusman, cone drive, q. c., chuck. athe, 16"x9' Chard, cone drive.

Miller No. 3 Hendey Universaltbl., 48"x11", belt drive. Miller, No. 4B Becker vertical, table 10"x26". Pipe machines, 2. 4, 6, 8 and 12"

belt and motor drive.

Planer, 30"x30"x8" Gray, b. d., 3 hds.

Presses, inclineable, all sizes.

Punch, No. 3 Southwark 4x4", mtr. Shapers.14.16,20 & 24" various makes Shear, 8' Niagara, 15" gap, 3-16" cap.

FOR SALE BY

Brown Machinery Co.,

Brake, Chicago Steel, 8' 18 gauge. Drills, 14, 16, 20, 22, 24 & 42"
Drills, rail, Foote-Burt.
Drills, 16 & 20 spindle Natco. Gear hobbers, G. & E. 12" & 24". Ginders, cylindrical, 10x36" Norton, 12x36" Modern, 8x18" Modern; 12"x42" and 10"x30" Landis.

Grinders, disc. No. 6-20 Besly; No. 220 Badger automatic. 229 Badger automatic. Grinder, 84" Rotaty Heald, Hammers vert. 40 & 80 lb. Perfect. Lathes, 18"x8 & 8' Monarch Q. c.g., 16"x6" & 18"x8" Bradford; 18"x8' American 18"x12' American geared

hd., taper & turret attach .: 20"x8' Le Blond, heavy, q. c. g.: 36"x12' Putnam, taper attachment. Millers, plain, No. 1 American; No. 3 Fox.

Millers, universal, No. 2 Hendey-Norton; Lincoln type, No. Hendey; slab. Briggs type No.11. Planer, 42"x42"x10' Pond.

2333 N. 9th St., St. Louis, Mo.

Planer, 26"x26"x6' Whiteomb. Presses, straight side, No. 73 Swaine; No. 7 Zeh & Hahnemann, S. S. No. 7 Zeh & Hahuemann, S. S. Presses, o. b. i. Nos. 1, 2, 3, 4 Losibough Jordan; V & O No. 01. Punches, sgl. end. Cleveland 'C.' 26" thr. § in § ''. Rock River Style L rapid action, 24" thr. § '' in § ''. No. 6 L. & A 24" thr. § '' in § ''. No. 7 L. & A 10" thr. § '' in § ''. Punch & sin ars, oble, end, No. L-10 though a sin ars, oble, end, No. L-10 though a sin ars, oble, end, No. L-10 though a sin ars, oble, end, No. L-10 Saw, told, Hugley No. 14. L. Serew machines, No. 2½ P. & W.; 1415" P. & W.

1x15" P. & W. Seamer, double, Swaine hand, 24 ga. Shapers, 20" Columbia.

Shear, rotary bevel, [" Lennox Welder, spot. 25 k.w. Agnew 20-D; cap. two \(\frac{1}{2} \) pcs., 28" throat. Welder, butt. Federal, 25 cy., 440 v. Wood hog, Gruendler, 23\(\frac{1}{2} \) x34".

FOR SALE BY

Wigglesworth Machinery Company Cambridge, Mass.

199 Bent Street. Automatic, § "G. Gridley ser. 16,000. Boring mill, Cleveland 2§ "bar. Boring mill, 36" Bullard, Gear hobber, 18" H Gould & E.

Miller, 67x52x16' Ingersoll, 4 heads, Radial, 4' American, Thread roller, 2C Manville, m. d. Turret lathe, No.4 Warner&Swasey Miller, No.2 Kempsmith maximiller. geared head universal. Send for Complete Stock List.

FOR SALE BY

McDonald Machinery Co.,

Air comp., Ingersoll-Rand 7x6. Bolt mchs., Landis & Acme 14". Boring mill, Lucas No. 21 horizontal. Boring mills, Barrett 5" bar horiz, Boring mill, Niles 36" vert., 2 hds. Boring mills, Baush 44" vert., m. d. Brake, Ohl 10' No.10 ga. m.d. press. prake, Ohl IV NO.10 ga. m.d. press. Drills, Barnes 20" & 24" Camel back. Drills, Prentice 3'; Mueller 2'; Gear cutter, G. & E. 36" s. p. d. Gear cutter, G. & E. 86" m.d. Gear hobber, G. & E. 24" & 48", Grinder, B. & S. Nos. 10 & 16 plain. Grinder, P. & W. 12" vertical surf. Grinder Grinder Struck Property Property Struck Property Property Property Property Property Property Prope Grinder.Gardner 52"m.d., horiz, disc. Lathes, Reed-Prentice 16"x8', q.c.g., grd. hd.; Hendey 14"x6', q. c. g.; 50 others in stock

Milling machines, B.& S. No. 3 univ. Milling machines. Cincinati No. 2.

1535 N. Broadway, St. Louis, Mo.

Hendey No. 1-B, Kemp. No. 3; Ohio No. 29; vertical slott, attch., all universal; Cincinati No. 3 pl. LeBiond No. 3-H .; Brown & S. No. 3-B, s. p. d., Brown & Sharpe No. 3, all plain, Cincinnati 12"
Mfg.; Kempsmith, No. 33 Prod.
Cincinnati No. 3-S pl., s. p. d.

Planer, 60"x48"x10' Gray 2 heads. Punch press, Fer. No. S9-52 d. c. Cons. Nos. 1 & 2 o. b. i. Niagara

Cons. Nos. 1 & 20, b. 1. Staggara No. 66 D d.c.Ohl d.c.grd. Toledo No. 50 O. B. I. geared. Shapers, G.& E. S. & M.. Cin., Ohio American, Steptoe, Queen City, 12", 16", 18", 20", 24" and 26"; Cininnati 24" m. d. g. b.

Screw machine, Brown & Sharpe. No. 2 auto.; B. & S. No. 00 Auto. Turret lathes, W. & S. No. 2 Auniv.

FOR SALE BY

Chas. L. Molitor Machinery Co., 120-124 S. Clinton St., Chicago, Ill.

Boring mill, 50" Niles-Bement, Drill, Gould & Edlund, 3 sp. m. d. Drill, Barnes, 3 sp. camel back. Drill, Barnes, 3 sp., camel back, Drill, 34" Barnes 3 spindle. Drill, No. 2 Leland-Gifford (3), Drill, radial, 48" American. Drills, radial, 48" American. Drills, radial, 39" Fosdick, m. d. Lathe, 29" x8" American q. c. g. Lathe, 29" x8" Cincinnail, q. c. g. taper, Lathe, 14" x8" Cincinnail, q. c. g. taper, Lathe, 18" x8" L. & S. q. c. g. taper, Lathe, 13" x6" South Bend, q. c. g. zap. collet. gap, collets.

Miller, No. 3 Kempsmith univ. Miller, No. 21 Le Blond univ. Miller, No. 2 B. & S. univ. Miller, No. 3 B. & S. plain. Miller, No. 1-Y B. & S. plain.

Miller, vertical No. 3 Bristol. Miller, 8" Pratt & Whitney.

Miller, twin spline P. & W. Miller, No. 12 Brown & Sharpe, Millers, smaller sizes (6).

Miller, Knight vert. Nos. 12 and 2. Screw machines W. & S. No. 6, power cross feed; No. 4 W. & S. univ: No. 1, 2, 3, 4, W. & S. and Foster.

Screw machine, No. 1 B. & S. Screw machine, No. 1 B. & S. Screw mch., No. 7 Foster, pwr. c. fd. Screw mchs., No. 6 B. & S.; W. & S.; and Acme Fox tur.; also W. & S.

dbl. key lathes and cock grinders. Shapers, 16" Ohio m. d. high speed, Shapers, 26" Niles-Bement.

Shapers, 26" Niles-Bement. Shaper, 16" Milwaukee rotary table. Shapet, 16" Steptoe. Tappers, No. 2: X Garvin, Tappers, No. 1 Garvin. Tappers, \$" Rickert-Shafer, horiz. Tappers, 4" Rickert-Shafer, vertical.

Miscellaneous: arbor press, No. 4 Atlas. m. d.; Reed-Prentice prod. lathe, new: Diamond d. c. m. d. 34" diss grinder; Is" form grinder; Napier metal band saw; 4-sp. Pratt & W. nut tapper; 4", 1", 14" single and 3-sp. bolt cutters; miller, 24x14' Ingersoll; 27x7" Diamond heavy face grinder, 30" wheels: Nos. 0 and 2 Baker keyscaters.

FOR SALE BY

J. Bieser Mfg. & Machy. Co., 16th & Madison St., Springfield, Ill.

Air compressors & outfits. Band saws, 22" 1" 36" Grinder, Lands Univ. No. 12. Grinder, Besley disk, 19". Knife grinder, 79".

Lathe 36"x18" L. & S. arr. m.d. Milling mach. No 6 Transit. Radial drill, 7' Bement. Shear, E-1 Badger, bar. Trip hammers, 50-150 lb.

FOR SALE BY

United Machinery & Supply Co., 1241 Walton Ave., St. Louis, Mo.

Boring mill, 4' Bullard Brake, box and pan, 5' D. & K. Compressor, C. P.511 ft., 2 stage, m.d. Grinders U S .. 8 h. p., a. c. Hammers, steam, board and spring.

Lathes, 16" Lehman & Hendey. Miller, thread G.B. 14" bet, centers, Press, No. 3 trioming, b. g., m. d. Saw, friction, 50", motor drive. Shear, 12'x10 gauge Niagara, m. d.

FOR SALE BY

Bradley Machinery Co., 529 E. Jefferson, Ave., Detroit, Mich.

Drill, Natco multiple Drill, Barnes 3 spindle Gear cutter, No. 3 28" B. & S. Gear cutter, 13 B.&S. spur & bevel, Grinder, Gardner No. 6, disc. Grinder, No. 3 W. & M surface. Hammer, 500 lb. Bradley.

Keyseater, Burr. Lathes, all sizes Lathe, 12"15' P. & W., collets, Mill & dvill, No. 1 Knight, Mill, Waltham thread. Shaper, 10" P. & W. vertical.

FOR SALE BY

Joseph Hyman & Sons, . Tioga & Almond Sts., Philadelphia, Pa. POWER PRESS SPECIALISTS

No. 93 A Toledo, double crank 36" No. 4-F Bliss, double crank, 66" No. 3-G Bliss, double crank, 72" No. 6-B Bliss double crank 43"

No. 168 Totedo toggle. No. 34A Bliss toggle. No. 201 & 2014 V. & O. threaders, Hundredsof presses of various types.

FOR SALE BY

Goldsher Machinery Co.,

Grinder, internal Taylor & Fenn. Brake, Dreis & Krump, 10' 14 ga. Hoists, chain, 2, 3, 4 and 5 ton. Shaper, 28" Gould & E. b. g., c. d.

817 W. Lake St., Chicago, Ill. Steam hammer, 1000 lb, Belle, Toggle press, No. 162 Toledo, Toggle press, No. 1 Bliss,

Motors, 400 h. p. 3 ph. 220 v., slip ring, 500 r. p. m. complete. Large stock of machine tools. Send us your inquiries,

FOR SALE BY

The E. L. Essley Machinery Co. 831 Rees St., Chicago

Telephone Lincoln 6320 Boring bar, Cleveland, 24" spindle, Boring mill, 42" Colburn, vertical. Drill, radi d. 5' Fosdick. Grinder, No. 1 Le Blond tool & cut. Lathe, 42"x14' American, m. d. Lathe, 18"x14' Prentice.

Planer, 48"x44"x12" Cleveland. Shaper, 20" and 24" G. & E. Shaper, 22" Rockford. Sharer, 24" Rockford. Shear, Nia, No. 407-A, ring & circle, Shear, Niagara 8', 3/16" cap, Shear, Stoll 11', 14 ga.

Tools Offered at Bargain Prices

PUNCHES

No. 15 W.-W., 1/2" thru 3/4", 24" throat, motor drive.

No. 14 Williams & White 11/4" thru 1", 25" throat did. end, motor drive.

Size A. L. & A., 2" thru 11/4", 36" throat, motor drive.

throat, motor drive.
L. & A., 1½ thru 1, 36 T, m, d.
No. 2H & J., hor., 1 thru 1, 15 gap,
motor drive.

motor drive.

No. 3 H. & J. 1½* thru 1*; Shear 2½* rd., 30 T., motor drive.

No. 5 Beatty flyw., ¾* thru ½* m. d.

No. 7 Beatty 42* throat, motor drive.

Kling s. e. punch 2½* thru 1½*, 18* throat motor drive.

Annoa motor dive.

Rock River, ½* thru ½*, 36* T. m. d.

No. 2 H. & J., barshear, 1½* rd., m. d.

No. 1 H. & J., barshear, 1½* rd., m. d.

No. 10 H. & J., barshear, 1* rd., m.d.

No. 00 H. & J., barshear, 1* rd., m.d.

No. 00 Yankee punch, 10 gauge, b. d.

No. 66 Niagara hand power punch,

½* thru ½*.

SHEARS

L. A. 3/4"x42". 8" throat, m, d. No. 6 H. & J., 3/8"x96", 36" thr.,m.d. No. 6 ½ H. & J., 1"x96", 36" thr.,m.d. Loy-Nawrath, 3/16"x10' back gauge, motor drive.

PLATES-TOOL

Bending Roll, Drop end, 6'x 12" capacity, m. d. No. 2 H. & J. leveling roll, 50" wide.

BULLDOZERS—BENDERS

No. 5 W.-W. Bulldozer, b. d. No. 7 W.-W. Buildozers, b. d.

HAMMERS

2—75 lb. Bradley upright helve, b. d. 1—80 lb. Bradley upright helve, b. d. 1—Nazel 100 lb., motor drive.

CRANES

2-Shaw, 71/2-ton, span 571, d. c. 1-Erie, 71/2-ton, span 571, d. c.

AIR RIVETERS

MISCELLANEOUS

No. 5-H LeBlond Mill-Rebuilt. No. 6 Brown & Sharpe gear cutter 72". 5 ton Lo-Hed Hoist 440 A. C 2 ton Browning Hoists 440 A.C., (3). 2 ton P. H. Monorail Hoist 230 D. C. 14" Barr upright sensitive drill 20° W. F. & J. Barnes upright drill. 34° W. F. & J. Barnes upright drill. 41 American plain radial drill No. 2 Modern universal tool grinder. 18 National washer making machine. No. 2A Saunders pipe cutter. Racine hack saw. 141/2 G Metropelitan steam injectors. No. 6 Sturtevant blower. No. 8 Sturtevant blower. Acme bolt threader, 20, (3). B. & K. pipe threader, 48

Columbus pipe threader, 6*.
Geared hand power pipe threader 1½
to 6*, r. and i. dies.
¾* National upsetter cont. motion.
Cleveland wall typ- rachial drill.
Lewis rail breaker, motor drive.
150-ton Putnam wheel proc.
Oliver 10.3 wood trimmer.
Beaman & S., open s. slab miller.
Brown & Sharpe vertical pulley lathe,
swing 36*.
0. 2 Pedrick floor type boring mill,

No. 2 Pedrick floor type boring mill, 6" bar, motor drive. Springfield surface grinder, 30" diameter wheel.

Beatty Machine & Manufacturing Co. 954-150th Street, Hammond, Indiana

MODERN MA

BORING MILLS

24° Bullard New Era, m. d.

30 Gisholt Vertical, belt.

36" Bullard Vertical, cone.

36" Colbum Vertical, gear box. 37º Niles Vertical, 2 heads gear box.

40* King Vertical, belt. 42" Bullard Rapid Production, belt.

60" Bauah Vertical, belt.

90" Niles Heavy Pattern Vertical, m. d. with D.C. motors, power rapid traverse, steel bars and rams, late type.

DRILLS 51, 61 American Triple Pur. Rad., g. b. 51 Cinc. Bick. Plain Radial, gear box. 5' Cinc. Bick. Univ. Radial, gear box. 21/21, 31 Carlton Sensitive Radial. 41 Hammond Jack Knife Radial. 4º Morris Plain Radial, gear box. 61 Dreses Universal Radial, gear box. 1,2,4,6,8, spindle Allen H. S. B. B. 4 spindle No. 2 Avey-Matic B. B. 4, 6 spindle No. 3 Avey H. S. B. B. 2 spindle No. I Avey H. S. B. B. 2. 4 spdl. Leland & Gifford H. S. B. B. 3 spdl. Demco H.S. B.B., power feed. 3 spdl. Leland&G. H.S. B.B., pwr.feed. 4 spdl.22 Barnes all Geared Self-Oiling. 4 spindle No. 2 Colburn Mfg. 4 spindle No. 2 Foote-Burte. 4 spindle No. 4 Foote-Burte. D2, D3, D4 Colburn H. D. No. 2, 4, 14, 22 Colburn Mfg. 5 spindle Detroit Semi-Auto, Horizontal. 6 spindle No. 1/2 Avey H. S. B. B. 6 spindle No. 2 Foote-Burte. No. 1 Pratt & W. 2 spdl. Gun Drill. No. 2 Baush Multiple Drill. No. 7D Moline 2 spindle Hole Hog. No. 10C Natco Multiple Drill.

No. 18 Natco Multiple Drill.

No. 25 Baush Multiple D., m.d., tapper, No. 26C Fox Multiple Drill and tapper. No. 30 Natco Multiple Drill, m. d. No. 216, 220 Baker 2 spdl. H.D., No. 217,310,314,315 Baker H.D.

GRINDERS

No. 218 Besly B. B. Dbl. Spd!. Disc. m. d., latest. No. 226 Besly B.B. Dbl. Spdl. Disc.,

m. d., latest type.

No. 4 Gardner b. b. Disc, belt. No. 120 Gardner Combination Disc. belt. No. 24-53 Gardner Horizontal Disc.

No. 10U Norton Lapper, m. d. No. 2F Norton Lappers, m.d., like new

No. 2 Diamond Auto. Surface, belt. No. 2 Diamond Auto. Surface, m. d.

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No. 25A Heald Rotary Surface, m. d., 30" chuck.

No. 78 Wilmarth & Morman Automatic Surface, motor drive.

18x48* Diamond Light Duty Face, m.d. Nos. 11/2, 4 Landis Universal, belt. 12x36 Cinc. Self-Cont. Univ. Cyl., 3 motor drive.

12x72* Cinc. Self-Cont. Univ. Cyl., 3 motor drive.

No. 3 Brown & Sharpe Universal, belt. No. 3A 16x48" Cinc. Univ. Cyl., belt. 6x18", 10x24", 10x30", 10x36", 10x36", 10x52", 10x72", 12x36", 12x52", 12x72", 12x120", 16x32", 16x52", 16x72* Landis Plain Self-Contained Cylindrical, m. d.

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Henry & Wright 2, 4, 6, 8 spdl, high
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motor drive. Fosdick 5' box column radial, s. p. d. Niles 31 box column radial; cone drive. Colburn No. 4 hi duty; m. d., A-1. Colburn No. 2 hi duty; t. & 1. pul. dr. Baker No. 310 hvy. duty, belt driven. Foote-Burt No. 25 h. d.; sgl. pul. dr. Foote-Burt 4-spindle rail type; b. d. Barnes camel back 3-spindle; m. d. Barnes camel back 2-spindle; belt dr. Barnes 3-spindle 20°; p. f.; belt dr.

BETTS 55' x 55' x 30' SPUR GEARED PLANER

With two heads on rail; separate motor for power elevation to rail; direct connected reversing motor drive complete with push button and control panel,

THE E. A. KINSEY CO.

333 West Fourth St.,

Est. 1886

Cincinnati, O.

Index of Advertisers

| Abart Gear & Machine Co 94 | Falk Mill Supply Co 127 |
|---|---|
| Acme Industrial Co 80 | Federal Products Corp |
| Adams Machinery Co 159 | Flynn Manufacturing Co |
| Alamo Engine Co 162 | Ford City Machinery Sales Co 146 |
| Allsteel Press Co., Inc | Ford Motor Co. Johannon Div. 76 |
| American Hollow Boring Co 81 | Friis & Miller |
| American Rotary Tools Co 92 | Fulflo Specialties Co. 20 |
| American Tool Works, Inc | Friis & Miller |
| Anderson Bros. Mfg. Co | Galland-Henning Mfg. Co. 71 |
| Atmglo Company 115 | General Blower Co. 127 |
| Armstrong-Blum Mfg. Co. | General Blower Co |
| Inside Front Course | Gerding Bros. 106 |
| Armstrong Bros. Tool Co | Cite Bros Mfa Co 87 |
| Armstrong Bros. Tool Co. 98 | Coldman Harray H |
| Atlas Press Co | Gits Bros. Mfg. Co. 87 Goldman, Harvey H. 161 Goldsher Machinery Co. 136 |
| Avey Drilling Machine Co. 14 | Graham Manufacturing Co 74 |
| Baldor Electric Co | Grant Mfg. & Machine Co 101 |
| Baumbach Mig. Co., E. A 105 | C-L. C. C. 100 |
| Beatty Machine & Mfg. Co 137 | Grobet File Corporation 108 |
| Belyea Company 132 | Grob Brothers Hamilton Tool Co |
| Bennett-Rafkin Machinery Co 142 | Hamilton I col Co 106 |
| | Hammond Machinery Builders 43 |
| Bernstein & Co., Geo. M | Hardinge Brothers, Inc. |
| Deverty I moatiest Snear Co 104 | Front Cover, 6 Hartford Special Machinery Co. 112 |
| Bleset Mfg. & Mchy. Co | Hartford Special Machinery Co. 112 |
| Bradley Machinery Co | Haskins Co., R. G. 30 Heimann Mfg. Co. 75 Henry & Wright Mfg. Co. 21 |
| Breuer Electric Co | Heimann Mfg. Co 75 |
| Brewster Company, Inc | Henry & Wright Mfg. Co 21 |
| Brown Machinery Co 134 | |
| Brownell Machinery Co | Hill-Clarke Machinery Co 141 |
| Buffalo Forge Co12-13 | Plotel Calbson 104 |
| Burke Machine Tool Co | Hotel Sterling 92 |
| Burs Machine I 501 Co. Burns Machinery Co., F. W. 153 Burn & Son, J. T. 106 Carlson Mig. Co., C. H. 108 Carroll Mig. Co., L. W. 108 Carroll Mig. Co., L. W. 116 Chicago Die Casting Mig. Co. 19 | Hotel Sterling 92 Howarth Machinery Co., C. C. 154 |
| Burr & Son, J. T 106 | Hyman & Son, Joseph 136 |
| Carlson Mfg. Co., C. H 108 | Illinois Testing Laboratories, Inc. 82 |
| Carroll Mfg. Co., L. W., 108 | Indianapolis Machinery & Supply |
| Carroll & Son, Wm 116 | Co |
| Chicago Die Casting Mfg. Co 19 | International Mchy. Co 130 |
| | Interstate Machinery Co 147 |
| Chicago Gear Works 116 | Iroquois Machinery Co. 154 |
| Chicago Rawhide Mfg. Co 89 | Johnson & Sons Mchy.Co., Wm.C. 130 Johnson Tool Co. 116 Jones Mch. Tool Co. Cincinnati. 156 |
| Chicago Tool & Engineering Co. 96 | Johnson Tool Co. 116 |
| Chicago Wheel & Mfg Co 84-85 | Jones Mch. Tool Co. Cincinnati 156 |
| Cincinnati Mchy. & Supply Co 145 Cleereman Machine Tool Co 88 | Vincen Co. F. A. 164 |
| Cleereman Machine Tool Co 88 | Kinsey Co., E. A |
| Clements Mfg Co | I W Charl C- |
| Clinton Machinery Co 154 | L-W Chuck Co |
| Clements Mfg. Co. Clinton Machinery Co | Law Chuck Co. 83 Lake Machinery Co. 160 |
| Inc 51 | Lewthwaite Machine Co., T. H. 91 Libert Machine Co. 81 |
| Cullman Wheel Co Back Cover | Libert Machine Co |
| Davis Machinery Co 128 | Linley Bros. Co. 89 Littell Machine Co., F. J. 95 |
| Delta Mfg. Co | Littell Wachine Co., F. J 93 |
| Delta Mfg. Co | Long Machinery Corp |
| Company Inside Back Cover | Lovejoy I ool Works |
| C I C | Lucas & Son, J. L., |
| Eagle Engineering Co | Luma Electric Equipment Co 90 M-B Products |
| Eastern Machinery Co138-139 Einler Engineering Co., Inc106 | M-B Products |
| Easter Engineering Co., Inc 106 | McDonald Machinery Company 135 |
| Emerman, Louis E | McMahon Co., Frank |
| Erie Electric Motor Repair, Inc 159 | McMullen Co., G. K 152 |
| Errington Mechanical Laboratory 55 | McMullen Co., G. K |
| Enley Machinery Co., E. L 136 | Machinists I ool Grinding Co 0/ |
| Etteo Tool Co | Mall Tool Company 101 |
| | |

Index of Advertisers-Continued

| Marsh Mohw Co A R 153 | Simmons Machine Tool Corp 151 |
|---|--|
| M. C. H. J. M. L. C. 121 | Chillian Machine Loot Coth 131 |
| Marsh Mchy, Co., A. R | Skilsaw, Inc. 53 Sloan & Chace Mfg. Co. 77 South Bend Lathe Works 16 |
| Martin Tool & Die Works, J. E. 103 | Sloan & Chace Mfg. Co. 77 |
| Massachusetts Gear & Tool Co. 86 | South Bond Lathe Washe 16 |
| Iviamachusetta Gear & I ool Co. 00 | South Dend Lathe Works 10 |
| Midwest Equipment Co | Speedway Mfg. Co 113 |
| Midwest Tool & Engineering Co. 110 | Stackbus Corn 26 |
| Whewest 1 doi of Engineering Co. 110 | Stackbin Corp. 26 Standard Electrical Tool Co 114 |
| Miles Machinery Co | Standard Electrical Tool Co 114 |
| Millholland Sales Co | Standard Machinery Co |
| Willing Sales Co | Candidate Wachinery Co 120 |
| Modern Collet & Machine Co 61 | Star Machine & Engineering Co. 105 |
| Molitor Machry, Co., Chas. A. 135 | Steege Machinery Co |
| Within Winchity, Co., Chas. 24. 122 | |
| Morey Machinery Co. Inc 140 | Strafer Machinery Co 127 |
| Morris Machinery Co., Inc 157 | Strand & Co N A 15 |
| twiotris iviacininery Co., inc | Strand & Co., N. A. 15 Strong, Carlisle & Hammond Co. 148 |
| Morris & Sons Co., Wm | Strong, Carlisle & Hammond Co. 148 |
| Morrison Machine Products, Inc. 7 | Sturdimatic Tool Co |
| 14 . D : 4 346 C 154 | C 14 1 C 155 |
| Motor Repair & Mfg. Co | Sun Machinery Co |
| Multiple Boring Mch. Co 114 | Sundstrand Machine Tool Co. 41 |
| | Sundstrand Machine Tool Co. 41 Super Speed Press Corp., 93 |
| Narragansett Machine Co 76 | Super Speed Fress Corp., |
| National Machine Tool Co 74 | Swedish Gage Co. of America 94 |
| I vanonal iviachine I ool Co /4 | Swadish Case Co of America 94 |
| Nielsen, Inc. | C Course Co. of Panicipality |
| Nielsen, Inc. 111 Nicholson & Co., W. H. 109 Norgren Co., C. A. 76 | Syntron Co |
| Michigan of Co., W. II | |
| Norgren Co., C. A | Tannewitz Works 102 |
| Norton-Broadway Machinery Co. 163 | Taylor Machine Co 90 |
| | Taylor Machine Comment |
| O'Brien Machinery Co | I imesaver Products Co., |
| O Differ Machinery Co | Taghn los |
| Odin Universal Corp 37 | Thus Waldes Engloss 22 |
| O. K. Tool Co 45 | Timesaver Products Co., 67 Taghn, Jos. J. 71 Thor Welder Factory. 22 Tom's Machine Co. 110 Tucker, Inc., W. W. & C. F. 65 |
| OF 1 | Tom's Machine Co 110 |
| Oliver Instrument Co 100 | Tucker Inc. W. W. A.C. F. 65 |
| Oliver Machinery Co 87 | I dewel, inc., W. W. of C. I |
| Osborne & Sexton Mchy. Co 155 | United Machinery & Supply Co. 136 |
| Ondome of Sexion Wichy, Co 177 | Canted Machinery of Supply Co. 150 |
| Ott Machinery Sales, Inc | United Precision Products Co |
| | Used and Rebuilt Machinery 127-164 |
| Pier Equipment Co | |
| Pratt & Whitney Co 10-11 | Vacuum Cup Metal Pulley Co 108 |
| D C C C 1 C 24 26 | Tacada Cup Inclus a day Com. 100 |
| | |
| Procunier Safety Chuck Co24-25 | Valley Electric Corp 97 |
| Production Machine Co. 78 | Valley Electric Corp 97 Victor Machinery Co 156 |
| Production Machine Co. 78 | Victor Machinery Co 156 |
| Production Machine Co | Victor Machinery Co |
| Production Machine Co | Victor Machinery Co |
| Production Machine Co | Victor Machinery Co |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 | Victor Machinery Co |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 | Victor Machinery Co. 156 Victor Machinery Exchange 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 | Victor Machinery Co. 156 Victor Machinery Exchange 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig. Co. 1, R. 92 92 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig. Co. 1, R. 92 92 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mfg. Co., J. R. 92 Reliance Machinery Sales Co. 134 | Victor Machinery Co. 156 Victor Machinery Exchange 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walter-Turner Co. 57 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig. Co., J. R. 92 Reisance Machinery Sales Co. 134 Renu Tool Co. 107 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walk Sales Corporation. 82 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reisne Milg. Co. 1, R. 92 Reliance Machinery Sales Co. 134 Renu Tool Co. 107 Revnolds Machinery 162 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walk Sales Corporation. 82 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reisne Milg. Co. 1, R. 92 Reliance Machinery Sales Co. 134 Renu Tool Co. 107 Revnolds Machinery 162 | Victor Machinery Co. 156 Victor Machinery Exchange 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker - Tuner Co. 57 Walks Sales Corporation 82 Walton Co. 109 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig. Co., J. R. 92 Reisnee Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery. 162 Rickert Shafer Co. 111 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walker Sales Corporation. 82 Walkon Co. 109 Wardwell Manufacturing Co. 72 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig. Co., J. R. 92 Reisnee Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery. 162 Rickert Shafer Co. 111 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vinco R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Tumer Co. 57 Walks Sales Corporation. 82 Walker Machinery Co. 72 Walker Machinery Co. 72 Weiner Machinery Co. 162 Valion Co. 162 Valion Co. 163 Valion Co. 165 Veiner Machinery Co. 162 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig. Co., J. R. 92 Reisnee Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery. 162 Rickert Shafer Co. 111 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walks Sales Corporation. 82 Walson Co. 109 Wardwell Manufacturing Co. 72 Weiner Machinery Co., Inc. 150 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig, Co., J. R. 92 Reliance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery 162 Rickert Shafer Co. 111 Ridge Tool Co. 63 Rigid Tool Holder Co. 103 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walks Sales Corporation. 82 Walson Co. 109 Wardwell Manufacturing Co. 72 Weiner Machinery Co., Inc. 150 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig. Co. J. R. 92 Reliance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery. 162 Rickert Shafer Co. 111 Ridge Tool Co. 63 Rigul Tool Holder Co. 103 Riverside Machinery Depot. 149 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R.A. 128 Vonnegut Moulder Corp 113 Wade Instrument Co. 88 Wam Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walks Sales Corporation. 82 Walton Solve Corporation 72 Wardwell Manufacturing Co. 72 Weiner Machinery Co., Inc. 150 Weldon Tool Co. 3 Wells Manufacturing Corp. 59 |
| Production Machine Co. 78 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R.A. 128 Vonnegut Moulder Corp 113 Wade Instrument Co. 88 Wam Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walks Sales Corporation. 82 Walton Solve Corporation 72 Wardwell Manufacturing Co. 72 Weiner Machinery Co., Inc. 150 Weldon Tool Co. 3 Wells Manufacturing Corp. 59 |
| Production Machine Co. 78 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walks Sales Corporation. 82 Walson Co. 109 Wardwell Manufacturing Co. 72 Weiner Machinery Co., Inc. 150 Weldon Tool Co. 32 Wells Manufacturing Corp. 59 Wettman Machinery Co. 128 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig. Co., J. R. 92 Reliance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery 162 Rickert Shafer Co. 111 Ridge Tool Co. 63 Rigd Tool Holder Co. 103 Riverside Machinery Depot. 149 Riverside Machinery Depot. 149 Rivett Lathe & Grinder, Inc. 4 Rosenkrang, Weisbecker & Co. 4 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walke Sales Corporation. 82 Walton Co. 109 Wardwell Manufacturing Co. 72 Weiner Machinery Co., Inc. 150 Weldon Tool Co. 3 Wells Manufacturing Corp. 59 Wettman Machinery Co. 128 Western Machiner Col. 128 Western Machiner Col. 128 Western Machiner Col. 160 Western Machiner Col. |
| Production Machine Co. 78 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walks Sales Corporation. 82 Walson Co. 109 Wardwell Manufacturing Co. 72 Weiner Machinery Co., Inc. 150 Weldon Tool Co. 32 Wells Manufacturing Corp. 59 Wettman Machinery Co. 128 Western Machiner Tool Works. 69 Western Machine Tool Works. 69 Western Dol & Mic. Co. 104 |
| Production Machine Co. 78 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walks Sales Corporation. 82 Walson Co. 109 Wardwell Manufacturing Co. 72 Weiner Machinery Co., Inc. 150 Weldon Tool Co. 32 Wells Manufacturing Corp. 59 Wettman Machinery Co. 128 Western Machiner Tool Works. 69 Western Machine Tool Works. 69 Western Dol & Mic. Co. 104 |
| Production Machine Co. 78 | Victor Machinery Co. 150 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walkes Sales Corporation. 82 Walkon Co. 109 Wardwell Manufacturing Co. 72 Weiner Machinery Co., Inc. 150 Weldon Tool Co. 3 Wells Manufacturing Corp. 59 Wetstern Machiner Tool Works 69 Western Tool & Mfg. Co. 104 West Penn Machiner Co. 129 West Penn Machiner Co. 129 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig, Co., J. R. 92 Reliance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery . 162 Rickert Shafer Co. 111 Ridge Tool Co. 63 Rigid Tool Holder Co. 103 Riverside Machinery Depot. 149 Rivett Lathe & Grinder, Inc. 4 Rosenkranz, Weisbecker & Co. 11 Rod Co. 27 Rotto Air Tool Co. 27 Rotto Air Tool Co. 27 Rotto Air Tool Co. 27 Russell Ropine Par Co. 102 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walker Sales Corporation. 82 Walkoo Co. 109 Wardwell Manufacturing Co. 72 Weiner Machinery Co. 160 Weldon Tool Co. 53 Weldon Tool Co. 53 Wells Manufacturing Corp. 59 Wettman Machinery Co. 128 Western Machiner Tool Works 69 Western Tool & Mig. Co. 104 Western Pool & Mig. Co. 129 White Dental Mig. Co. 128 Wastern Machinery Co. 129 White Dental Mig. Co. 129 White Dental Mig. Co. 128 Weight Tool Mig. Co. 129 White Dental Mig. Co. 128 Weight Tool Mig. Co. 129 Weight Tool Mig. Co. 129 Weight Tool Mig. Co. 128 Weight Tool Mig. Co. 128 Weight Tool Mig. Co. 128 White Dental Mig. Co. 128 Weight Tool Mig. Mig. Mig. Mig. Mig. Mig. Mig. Mig. |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig, Co., J. R. 92 Reliance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery . 162 Rickert Shafer Co. 111 Ridge Tool Co. 63 Rigid Tool Holder Co. 103 Riverside Machinery Depot. 149 Rivett Lathe & Grinder, Inc. 4 Rosenkranz, Weisbecker & Co. 11 Rod Co. 27 Rotto Air Tool Co. 27 Rotto Air Tool Co. 27 Rotto Air Tool Co. 27 Russell Ropine Par Co. 102 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walker Sales Corporation. 82 Walkoo Co. 109 Wardwell Manufacturing Co. 72 Weiner Machinery Co. 160 Weldon Tool Co. 53 Weldon Tool Co. 53 Wells Manufacturing Corp. 59 Wettman Machinery Co. 128 Western Machiner Tool Works 69 Western Tool & Mig. Co. 104 Western Pool & Mig. Co. 129 White Dental Mig. Co. 128 Wastern Machinery Co. 129 White Dental Mig. Co. 129 White Dental Mig. Co. 128 Weight Tool Mig. Co. 129 White Dental Mig. Co. 128 Weight Tool Mig. Co. 129 Weight Tool Mig. Co. 129 Weight Tool Mig. Co. 128 Weight Tool Mig. Co. 128 Weight Tool Mig. Co. 128 White Dental Mig. Co. 128 Weight Tool Mig. Mig. Mig. Mig. Mig. Mig. Mig. Mig. |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig, Co., J. R. 92 Reliance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery . 162 Rickert Shafer Co. 111 Ridge Tool Co. 63 Rigid Tool Holder Co. 103 Riverside Machinery Depot. 149 Rivett Lathe & Grinder, Inc. 4 Rosenkranz, Weisbecker & Co. 11 Rod Co. 27 Rotto Air Tool Co. 27 Rotto Air Tool Co. 27 Rotto Air Tool Co. 27 Russell Ropine Par Co. 102 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vinc, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walkes Sales Corporation. 82 Walson Co. 109 Wardwell Manufacturing Co. 72 Weiner Machinery Co., Inc. 150 Weldon Tool Co. 3 Wells Manufacturing Corp. 59 Wettman Machinery Co. 128 Western Machiner Tool Works. 69 Western Tool & Mig. Co. 104 West Penn Machinery Co. 129 White Dental Mig. Co., S. S. 16 White Machinery Co. A. D. 159 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig, Co., J. R. 92 Reliance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery . 162 Rickert Shafer Co. 111 Ridge Tool Co. 63 Rigid Tool Holder Co. 103 Riverside Machinery Depot. 149 Rivett Lathe & Grinder, Inc. 4 Rosenkranz, Weisbecker & Co. 11 Rod Co. 27 Rotto Air Tool Co. 27 Rotto Air Tool Co. 27 Rotto Air Tool Co. 27 Russell Ropine Par Co. 102 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walker Sales Corporation. 82 Walker Sales Corporation. 82 Walker Sales Corporation. 82 Walker Sales Corporation. 109 Walker Sales Corporation. 109 Walker Machinery Co. 150 Weldon Tool Co. 150 Western Machinery Co. 128 Western Machiner Tool Wins. 69 Western Tool & Mig. Co. 104 Wester Ponn Machinery Co. 129 White Dental Mig. Co. 150 White Machinery Co. 17 Walker Tool Co |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig. Co., J. R. 92 Reisance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery 162 Rickert Shafer Co. 111 Ridge Tool Co. 63 Rigid Tool Holder Co. 103 Riverside Machinery Depot. 149 Rivett Lathe & Grinder, Inc. 4 Rosenkranz, Weisbecker & Co., Inc. 150 Rotor Air Tool Co. 27 Russell Boring Bar Co. 102 Russell Machine Co. 150 Russell Bachine Co. 150 Russell Machine Co. 150 Russell Machine Co. 150 Russell Machine Co. 160 Rushman Machinery Co. 86 Ryerson & Son, Joseph T. 69 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walker Sales Corporation. 82 Walker Sales Corporation. 82 Walker Sales Corporation. 82 Walker Sales Corporation. 109 Walker Sales Corporation. 109 Walker Machinery Co. 150 Weldon Tool Co. 150 Western Machinery Co. 128 Western Machiner Tool Wins. 69 Western Tool & Mig. Co. 104 Wester Ponn Machinery Co. 129 White Dental Mig. Co. 150 White Machinery Co. 17 Walker Tool Co |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig. Co., J. R. 92 Reisance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery 162 Rickert Shafer Co. 111 Ridge Tool Co. 63 Rigid Tool Holder Co. 103 Riverside Machinery Depot. 149 Rivett Lathe & Grinder, Inc. 4 Rosenkranz, Weisbecker & Co., Inc. 150 Rotor Air Tool Co. 27 Russell Boring Bar Co. 102 Russell Machine Co. 150 Russell Bachine Co. 150 Russell Machine Co. 150 Russell Machine Co. 150 Russell Machine Co. 160 Rushman Machinery Co. 86 Ryerson & Son, Joseph T. 69 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker Turner Co. 57 Walker Sales Corporation. 82 Walkon Co. 109 Wardwell Manufacturing Co. 72 Weiner Machinery Co. 16c. 150 Weldon Tool Co. 3 Weldon Tool Co. 23 Wells Manufacturing Corp. 59 Wester Machiner Co. 128 Wester Machiner Co. 104 Wester Pan Machinery Co. 129 White Dental Mfg. Co. 5, 16 White Machiner Co. 159 White Machiner Co. 159 White Machiner Co. 17 Winglesworth Machinery Co. 135 Winglesworth Machinery Co. 135 White Machinery Co. 135 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8.9 Racine Tool & Machine Co. 79 Reich Milg. Co., J. R. 92 Relsance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery Sales Co. 114 Ridge Tool Co. 111 Ridge Tool Co. 113 Rivet Lathe & Grinder, Inc. 4 Rosenkranz, Weisbecker & Co. 101 Rosenkranz, Weisbecker & Co. 102 Russell Boring Bar Co. 102 Russell Machine Co. 150 Ruthman Machinery Co. 86 Ryerson & Son, Joseph T. 69 Ryerson & Son, Joseph T. 69 Ryenon & Son, Joseph T. 69 Schauer Machine Co. 97 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walls Sales Corporation. 82 Walls Sales Corporation. 82 Walls Sales Corporation. 82 Walls Sales Corporation. 150 Wardwell Manufacturing Co. 72 Weight Manufacturing Corp. 53 Weldon Tool Co. 15 Wettman Machinery Co. 128 Western Tool & Mig. Co. 104 Western Tool & Mig. Co. 104 Western Machinery Co. 129 White Denlal Mig. Co. 15 White Machinery Co. 17 Wigglesworth Machinery Co. 17 Wigglesworth Machinery Co. 17 Wilson, K. R. 34 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig, Co., J. R. 92 Reikance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery . 162 Rickert Shafer Co. 111 Ridge Tool Co. 63 Rigid Tool Holder Co. 103 Riverside Machinery Depot. 149 Rivett Lathe & Grinder, Inc. 4 Rosenkranz, Weisbecker & Co. 110 Rotor Air Tool Co. 27 Russell Boring Bar Co. 102 Russell Machine Co. 102 Russell Machine Co. 103 Russell Boring Bar Co. 102 Russell Machine Co. 106 Rotor Air Tool Co. 27 Russell Boring Bar Co. 106 Ruthman Machinery Co. 86 Ryerson & Son, Joseph T. 69 Schauer Machine Co. 97 Scott-Bansbach Machinery Co. 133 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker Turner Co. 57 Walker Sales Corporation. 82 Walkon Co. 109 Wardwell Manufacturing Co. 72 Weiner Machinery Co. 16c. 130 Weldon Tool Co. 3 Weldon Tool Co. 23 Wells Manufacturing Corp. 59 Wettman Machinery Co. 128 Wester Machiner Co. 129 Wester Tool & Mig. Co. 104 West Penn Machinery Co. 129 White Machiner Co. 159 White Machiner Co. 159 White Machiner Co. 159 White Machiner Co. 135 White Machiner Co. 135 Wilson, K. R. 34 Wittek Manufacturing Co. 99 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig, Co., J. R. 92 Reikance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery . 162 Rickert Shafer Co. 111 Ridge Tool Co. 63 Rigid Tool Holder Co. 103 Riverside Machinery Depot. 149 Rivett Lathe & Grinder, Inc. 4 Rosenkranz, Weisbecker & Co. 110 Rotor Air Tool Co. 27 Russell Boring Bar Co. 102 Russell Machine Co. 102 Russell Machine Co. 103 Russell Boring Bar Co. 102 Russell Machine Co. 106 Rotor Air Tool Co. 27 Russell Boring Bar Co. 106 Ruthman Machinery Co. 86 Ryerson & Son, Joseph T. 69 Schauer Machine Co. 97 Scott-Bansbach Machinery Co. 133 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walker Sales Corporation. 82 Walker Sales Corporation. 82 Walker Good Co. 109 Walker Machinery Co. 160 Weldon Tool Co. 150 Weldon Tool Co. 150 Weldon Tool Co. 150 Western Machinery Co. 128 Western Machinery Co. 129 Western Machinery Co. 129 Western Machinery Co. 140 Western Machinery Co. 17 Winglesworth Machinery Co. 17 Winglesworth Machinery Co. 17 Wilson K. R. 34 Witte Manufacturing Co. 99 Wolshie Machinery Co. 127 Wilson K. R. 34 Witte Manufacturing Co. 99 Wolshie Machinery Co. 22 Wolshie Machinery Co. 22 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools. 8-9 Racine Tool & Machine Co. 79 Racine Tool & Machine Co. 192 Reishance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery 162 Rickert Shafer Co. 111 Ridge Tool Co. 63 Riverside Machinery Depot. 149 Rivett Lathe & Grindre, Inc. 4 Rosenkranz, Weisbecker & Co. 107 Roynolds Machinery Co. 107 Roynolds Machine Co. 107 Roynolds Machine Co. 107 Roynolds Machine Co. 107 Russell Boring Bar Co. 102 Russell Machine Co. 150 Ryerson & Son, Joseph T. 69 Schauer Machine Co. 97 Scott-Bansbach Machinery Co. 133 Scully-Jones & Co. 151 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walker Sales Corporation. 82 Walker Sales Corporation. 82 Walker Good Co. 109 Walker Machinery Co. 160 Weldon Tool Co. 150 Weldon Tool Co. 150 Weldon Tool Co. 150 Western Machinery Co. 128 Western Machinery Co. 129 Western Machinery Co. 129 Western Machinery Co. 140 Western Machinery Co. 17 Winglesworth Machinery Co. 17 Winglesworth Machinery Co. 17 Wilson K. R. 34 Witte Manufacturing Co. 99 Wolshie Machinery Co. 127 Wilson K. R. 34 Witte Manufacturing Co. 99 Wolshie Machinery Co. 22 Wolshie Machinery Co. 22 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig, Co., J. R. 92 Reliance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery 162 Rickert Shafer Co. 111 Ridge Tool Co. 63 Rigid Tool Holder Co. 103 Riverside Machinery Depot. 149 Rivett Lathe & Grinder, Inc. 4 Rosenkranz, Weisbecker & Co. 162 Rotor Air Tool Co. 27 Russell Boring Bar Co. 102 Russell Machiner Co. 163 Russell Machiner Co. 163 Russell Machiner Co. 164 Rotor Air Tool Co. 27 Russell Boring Bar Co. 162 Rushman Machinery Co. 169 Schauer Machine Co. 97 Scott-Bansbach Machinery Co. 133 Scully-Jones & Co. 151 Sebastian Lathe Co. 150 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walker Sales Corporation. 82 Walker Sales Corporation. 82 Walker Good Co. 109 Walker Machinery Co. 160 Weldon Tool Co. 150 Weldon Tool Co. 150 Weldon Tool Co. 150 Western Machinery Co. 128 Western Machinery Co. 129 Western Machinery Co. 129 Western Machinery Co. 140 Western Machinery Co. 17 Winglesworth Machinery Co. 17 Winglesworth Machinery Co. 17 Wilson K. R. 34 Witte Manufacturing Co. 99 Wolshie Machinery Co. 127 Wilson K. R. 34 Witte Manufacturing Co. 99 Wolshie Machinery Co. 22 Wolshie Machinery Co. 22 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig, Co., J. R. 92 Reliance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery 162 Rickert Shafer Co. 111 Ridge Tool Co. 63 Rigid Tool Holder Co. 103 Riverside Machinery Depot. 149 Rivett Lathe & Grinder, Inc. 4 Rosenkranz, Weisbecker & Co. 162 Rotor Air Tool Co. 27 Russell Boring Bar Co. 102 Russell Machiner Co. 163 Russell Machiner Co. 163 Russell Machiner Co. 164 Rotor Air Tool Co. 27 Russell Boring Bar Co. 162 Rushman Machinery Co. 169 Schauer Machine Co. 97 Scott-Bansbach Machinery Co. 133 Scully-Jones & Co. 151 Sebastian Lathe Co. 150 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walker Sales Corporation. 82 Walker Sales Corporation. 82 Walker Good Co. 109 Walker Machinery Co. 160 Weldon Tool Co. 150 Weldon Tool Co. 150 Weldon Tool Co. 150 Western Machinery Co. 128 Western Machinery Co. 129 Western Machinery Co. 129 Western Machinery Co. 140 Western Machinery Co. 17 Winglesworth Machinery Co. 17 Winglesworth Machinery Co. 17 Wilson K. R. 34 Witte Manufacturing Co. 99 Wolshie Machinery Co. 127 Wilson K. R. 34 Witte Manufacturing Co. 99 Wolshie Machinery Co. 22 Wolshie Machinery Co. 22 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L. Tools. 8-9 Racine Tool & Machine Co. 79 Resch Mfg. Co., J. R. 92 Relsance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery Sales Co. 134 Rickert Shafer Co. 117 Ridge Tool Co. 63 River Laber Co. 118 Ridge Tool Co. 103 Riverside Machinery Depot. 149 Rivett Lathe & Grindry, Inc. 4 Rosenkranz, Weisbecker & Co. 107 Roynolds Machinery Co. 107 Russell Boring Bar Co. 102 Russell Machine Co. 150 Ryerson & Son, Joseph T. 69 Ryerson & Son, Joseph T. 69 Schater Machine Co. 97 Scott-Bansbach Machinery Co. 133 Scully-Jones & Co. 151 Sebatian Lathe Co. 150 Regal Machiner Co. 150 Regal Machiner Co. 151 Sebatian Lathe Co. 150 Regal Machinery Co. 150 Regal Machinery Co. 150 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Tumer Co. 57 Walker-Tumer Co. 109 Walko Sales Corporation. 82 Walso Co. 109 Wardwell Manufacturing Co. 72 Weiner Machinery Co., Inc. 150 Weldon Tool Co. 150 Weldon Tool Co. 150 Weldon Tool Co. 150 Western Tool & Mig. Co. 104 Western Machinery Co. 129 Western Machinery Co. 129 White Denlal Mig. Co. 150 White Machinery Co. 17 Wigglesworth Machinery Co. 17 Wigglesworth Machinery Co. 17 Wigglesworth Machinery Co. 18 Wilson, K. R. 34 Wittek Manufacturing Co. 99 Wolnick Machinery Co. 127 Wright, L. G. 107 Wrought Washer Co. 65 |
| Production Machine Co. 78 Progressive Tool & Cutter Co. 80 Putnam Tool Co. 31 Pyrometer Instrument Co. 96 R & L Tools 8-9 Racine Tool & Machine Co. 79 Reich Mig, Co., J. R. 92 Reliance Machinery Sales Co. 134 Renu Tool Co. 107 Reynolds Machinery 162 Rickert Shafer Co. 111 Ridge Tool Co. 63 Rigid Tool Holder Co. 103 Riverside Machinery Depot. 149 Rivett Lathe & Grinder, Inc. 4 Rosenkranz, Weisbecker & Co. 162 Rotor Air Tool Co. 27 Russell Boring Bar Co. 102 Russell Machiner Co. 163 Russell Machiner Co. 163 Russell Machiner Co. 164 Rotor Air Tool Co. 27 Russell Boring Bar Co. 162 Rushman Machinery Co. 169 Schauer Machine Co. 97 Scott-Bansbach Machinery Co. 133 Scully-Jones & Co. 151 Sebastian Lathe Co. 150 | Victor Machinery Co. 156 Victor Machinery Exchange. 144 Vinco Tool Co. 47 Vine, R. A. 128 Vonnegut Moulder Corp. 113 Wade Instrument Co. 88 Wain Machinery Sales, Chas. E. 127 Walker-Turner Co. 57 Walker Sales Corporation. 82 Walker Sales Corporation. 82 Walker Good Co. 109 Walker Machinery Co. 160 Weldon Tool Co. 150 Weldon Tool Co. 150 Weldon Tool Co. 150 Western Machinery Co. 128 Western Machinery Co. 129 Western Machinery Co. 129 Western Machinery Co. 140 Western Machinery Co. 17 Winglesworth Machinery Co. 17 Winglesworth Machinery Co. 17 Wilson K. R. 34 Witte Manufacturing Co. 99 Wolshie Machinery Co. 127 Wilson K. R. 34 Witte Manufacturing Co. 99 Wolshie Machinery Co. 22 Wolshie Machinery Co. 22 |

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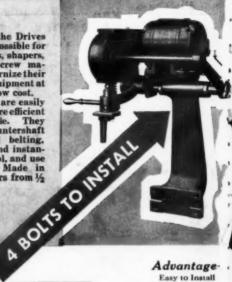
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